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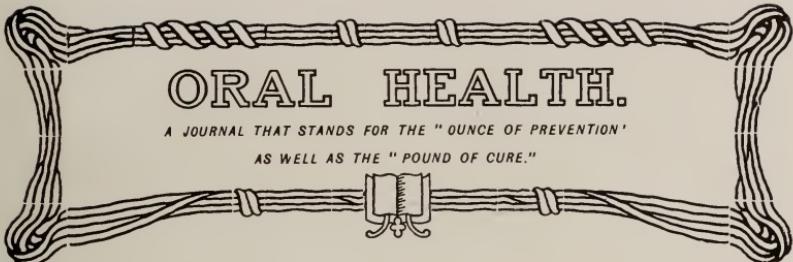
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*"Why does one climate and one soil endue
The blushing poppie with a crimson hue,
Yet leave the lily pale and tinge the violet blue?"*



A Prince of the Dental Profession.

EDWARD C. KIRK, D.D.S., Sc.D.
Philadelphia, Pa.



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TORONTO, JANUARY, 1914

No. 1

*A Reconsideration of the Etiology of Dental Caries and a New Theory of Caries Susceptibility.**

By EDWARD C. KIRK, D.D.S., Sc. D., PHILADELPHIA, PA.

In his work on Operative Dentistry, in discussing the historical features of caries of the teeth, Dr. G. V. Black presents a photographic reproduction from an old German work published anonymously in 1530, the original of which is part of my private collection of dental literature and is probably the oldest record, at least in a separate dental publication, of a theory of dental decay which doubtless had its beginnings in the remotest antiquity, and which in its essential features expresses the theory of dental caries generally accepted to-day.* The translation of the paragraph referred to is as follows: "Caries is a disease and defect of the teeth in which they become full of holes and hollow, which most often affects the molars (*Backenzahne*), especially if one eats and does not clean them of the adhering food, which decomposes, producing a bad acid moisture which eats them and corrodes them out, increasing continually little by little so that it destroys the teeth entirely, which thereupon finally rot away in pieces, not without pain."

*Read before the Toronto Dental Society, on November 29, 1913, and published in Oral Health concurrently with the Dental Cosmos by courtesy of the author.

*G. V. Black, "Operative Dentistry," vol. i, page 60.

ORAL HEALTH.

Various other theories have been proposed in explanation of tooth caries, but none has received the extensive acceptance over so long a period of time as that embodied in the foregoing quotation; and justly so, for its conclusions were derived from widespread and intelligent observation.

In the closing quarter of the nineteenth century, interest in the problem of dental caries had progressed to a point where its serious study was being undertaken and scientific methods were beginning to be applied as the means for its solution. Of this the work of Leber and Rottenstein, of Magitot, and of Underwood and Milles, are notable examples, the valuable researches of the last-named having been presented before the Dental Section of the International Medical Congress in London in 1881. The communication of these investigators served to actively revive an interest in the germ theory of dental decay, inasmuch as they brought out the close relationship of bacteria to caries—for they noted the constant presence of micro-organisms in decaying dentin, and the widening of the tubules produced by them; and they stated as their conviction that in the decay of the hard tooth structures, “Two factors have always been in operation, (1) the action of acids, and (2) the action of germs”; and they say further, “This theory, which for the sake of distinction may be called the septic, is rather an amplification of the chemical theory than a contradiction of it. Most probably the work of decalcification is entirely performed by the action of acids, but these acids are, we think, secreted by the germs themselves, *and the organic fibrils upon which the organisms feed and in which they multiply are the scene of the manufacture of their characteristic acids, which in turn decalcify the matrix and discolor the whole mass.*” (Italics mine.)

It will be readily seen from the foregoing that Underwood and Milles were, to use a colloquialism, “hot on the trail” of the decalcifying agency concerned in the process of tooth decay, in which connection I wish to particularly direct your attention to the closing lines of the paragraph just quoted relating to the organic fibrils being the scene of manufacture of the characteristic acids of bacterial activity, a point of importance to which I shall take occasion to refer later in this paper.

In 1882-83 and thereafter, W. D. Miller, of Berlin, began the publication of a series of papers, the first in *Klebs' Archives*, detailing his experiments and his conclusions

therefrom, constituting a report of his researches into the nature of the carious process, and particularly as to the mode of production of the decalcifying agent concerned in the process, with the well-known result that Miller proved uncontestedly that the acid which was the active decalcifying agent is lactic acid produced through the ferment agency of certain classes of bacteria that have the power to split up monosaccharids into lactic acid. The brilliancy of his research and the definiteness of his conclusions secured for them practically universal acceptance, thus sealing with scientific approval the ancient theory of decay which I have already quoted from the old book record in the beginning of this paper.

In all of Miller's experiments having for their object the artificial reproduction of dental caries, it will be noted that he worked with a culture medium the basis of which was some form of starchy foodstuff; and a careful study of all of his work in connection with dental caries shows that he was dominated by the idea that caries of the teeth is produced in its first stages by the fermentation of adherent alimentary carbohydrate food debris, and as a matter of fact by subjecting the alimentary carbohydrate food material to fermentation through the agency of mouth bacteria; and, by immersing sections of sound tooth structure in the culture media so prepared, he was able to reproduce the carious process in both dentin and enamel in a way which so perfectly simulated tooth decay produced under normal conditions in the mouth, that careful and competent scientific observers were unable to detect the difference either macroscopically or microscopically.*

Miller died in July, 1907. His later scientific communications in so far as they were related to the problem of dental caries did not deal directly with its etiology, as he apparently regarded his earlier researches on that point as being conclusive—for, writing in 1900, he says:

"Caries results from the accumulation and retention of particles of food between or in fissures, depressions, etc., upon the free surfaces of the teeth, which places we call *retention centres*. If, in filling a cavity in a tooth, we do not thereby obliterate the retention centre which previously gave rise to decay, there is every reason to suppose that decay may make its reappearance in the course of time."

*Miller, "Micro-organisms of the Human Mouth," p. 196

The suggestion had been made to Miller by myself and in my published articles, notably in a communication read before the Ohio State Dental Society in 1902,[†] and recently in a paper read before the Michigan Dental Society,[‡] that susceptibility to caries might possibly be conditioned upon the presence in the saliva of a dissolved carbohydrate, the product of metabolism, and not wholly upon the debris of alimentary carbohydrates in the mouth. This suggestion was rejected by Miller after he had made some experiments to determine the possibility of the occurrence of a metabolic carbohydrate in the saliva.[§]

It will be readily seen that the scientific confirmation which the researches of Miller gave to an easily understandable and widely accepted theory of tooth decay served to fasten almost indelibly upon the minds of all the belief that caries of the teeth is produced by fermentation of adherent food particles, and it is equally clear that belief in that view of the case has become the parent of the axiom that "Clean teeth will not decay"; and furthermore, it is clear that belief in the axiom that clean teeth will not decay is also the essential *motif* of the argument in favor of and the justification for the oral hygiene propaganda that has lately assumed such imposing proportions—so imposing, in fact, that it may seem to be an act of temerity on my part to even question for a moment the soundness of that doctrine; but I essay the task with hopefulness, because it appears to me to be one of those movements which has survived thus far because it is based upon a doctrine which has within itself a large modicum of truth, and which will survive eternally when it is shorn of its equally large modicum of error.

That Miller realized that his researches did not account for all of the phenomena of decay is clearly evident from his writings, for during the later years of his active life his attention was focused directly upon the problem of susceptibility and immunity to decay, and his studies were directed toward the task of harmonizing what he had already discovered about the etiology of dental caries with certain obscure features of the problem which did not seem to be explainable upon the basis of the conclusions which he had already reached. Briefly stated, Miller's researches have

[†]*Dental Summary*, 1903.

[‡]"The Problem of Dental Caries," *Dental Summary*, December, 1913.

[§]*Dental Cosmos*, vol. xlv, p. 694.

failed to explain the generally recognized phenomenon of variability in the susceptibility to caries.

Every practitioner knows that susceptibility to caries is not unlike the valor of Bob Acres, in that it is "a thing that comes and goes." So clearly and so broadly is this fact recognized that it is generally conceded among practitioners of dentistry that youth is the period of greatest susceptibility, and that, assuming normal conditions of health, the tendency to dental caries is markedly diminished, if indeed a period of immunity does not normally supervene, when adult age has been reached. It is also an equally well established fact that pregnancy tends to inaugurate a period of susceptibility to dental caries. The old axiom "For every child a tooth" has its equivalent expression in practically all civilized languages. It is also known from wide clinical observation that dental caries is not necessarily a filth disease. Some teeth kept as clean as patient and dental operator can keep them will decay, and decay recurrently. Other teeth in mouths into which the tooth-brush has never entered, and which are offensively filthy, do not decay, albeit they may show other manifestations of a pathological character. Our theory of the etiology of dental caries must therefore be sufficiently comprehensive to fairly explain these peculiarities, otherwise we have not arrived at the whole truth about dental caries.

That Miller himself realized that other factors must be taken into account is evident from the statement which I find in one of his papers published in 1900,* wherein he says, among other things: "The task which the dental investigator has before him to-day in dealing with the problem of dental caries is a far easier and simpler one than the pioneers had to deal with," and in reference to caries of the enamel he says:[†]

"In my book, "Micro-organisms of the Human Mouth," my account of the process of dental caries begins with the enamel cuticle. I distinctly called attention to the fact that the enamel cuticle in the early stages of caries forms a matrix for innumerable numbers of bacteria, and that the thickening of the enamel cuticle is due to growths of bacteria in this matrix. In the last stages of decay—*i.e.* of the enamel cuticle—we see only a mass of bacteria (cocci, rods, and

**Dental Cosmos*, vol. xlvi, p. 858: "Some Recent Contributions to the Study of the Decay of the Teeth."

[†]*Ibid.*

threads), which is held together by the remnant of the membrane. The membrane in this condition affords a matrix for bacteria, as well as for very minute particles of food, and thereby accelerates the progress of decay. This growth of bacteria in the enamel cuticle may possibly coincide with the film of Williams, although such films are not restricted to the surface of the enamel. Williams, Black, and others incline to the view that this film is necessary to the origin of caries, a point on which I am not yet quite convinced, as my observations would lead me to think that wherever food finds a permanent lodging place between the teeth to undergo acid fermentation, there decalcification is bound to take place in course of time, whether there be a film present or not.

It is interesting to note in connection with the foregoing two things: First, that the fermentation of food particles as the cause of the beginning of caries of the enamel is the dominant thought in the mind of Miller, and yet curiously enough he offers no explanation whatsoever of his statement that the enamel cuticle is first disintegrated by bacterial action, and that in this disintegrated magma of enamel cuticle disintegrate under the ferment action of bacteria before it was reduced to a condition in which alimentary carbohydrate debris could find a lodgment within the mass? Believing as he did in his theory of fermentation of carbohydrate food debris as the initial factor in caries production, he was naturally inclined to the view that the absence of carbohydrate food debris would mean the absence of caries production. He had already shown, and others have confirmed the fact, that lactic-acid-producing bacteria are practically constant inhabitants of the human mouth, both in those susceptible and those immune to dental caries; and in explanation of that fact he was inclined to lay stress upon the food habit of the individual as influencing susceptibility and immunity to caries—for, referring to his “Micro-organisms of the Human Mouth,” he says:*

“Many years ago I called attention to the fact that the course of fermentation depends frequently more upon the substratum than upon the micro-organism. Bacteria which grow upon white of egg, producing an intensely offensive smell and strong alkaline reaction, when brought into carbohydrates exhibit entirely different phenomena—viz., acid reaction and total absence of bad smell.”

**Dental Cosmos*, vol. xlvi, p. 859: “Some Recent Contributions to the Study of the Decay of the Teeth.”

Miller had previously discussed this view in the *Independent Practitioner*, in 1885, as well as in his book, and in various places later he had used it as the basis of his own explanation of the comparative immunity of meat-eating races, Eskimos, etc., also of the fact that caries does not take place in canals of teeth containing putrid pulps, and he also explained on the same ground the fact that persons of uncleanly habits may have very foul mouths and yet little caries when they live chiefly on animal food, and when through accumulations of tartar, etc., the gums are kept in an irritated condition, and their secretions and exudations, being albuminous, undergo alkaline fermentation.

Various observers have sought an explanation of the variation as to susceptibility to dental caries, in the difference in structural character or density of the teeth themselves. Prominent among these may be mentioned Carl Rose, whose extensive study of the subject is a classic in our literature. In the light of Miller's findings, and particularly in view of the exhaustive researches of Black, I think we may safely agree that differences in structure or density of the teeth are without influence in originating dental caries, and are factors that can only modify the rate of progress of the process. It is, therefore, undoubtedly true that the hardest teeth will decay in a carious environment, and that even the frailest teeth will not decay in a non-carious environment.

That food habit is a pronounced and important factor in determining susceptibility and immunity is generally conceded, though there are many instances of individuals and races of people whose diet is almost entirely carbohydrate, and who yet do not suffer more from caries than those who live upon a mixed diet. Investigations of food habit have not thus far revealed the principal factor upon which either susceptibility or immunity can be satisfactorily explained. How, then, may food habit modify susceptibility?

In several communications, notably those already referred to as having been read before the Ohio State Dental Society in 1902 and before the Michigan State Society in 1913, I called attention to the probable existence of a fermentable carbohydrate substance in the saliva, the result of carbohydrate metabolism derived from the blood through the medium of the salivary glands. My attention was first directed to this matter in some studies of the saliva that I made in the laboratory with Joseph Porter Michaels in

Paris in 1901. One of the routine tests made by Michaels in the examination of all specimens of saliva submitted to him was what he called the glycogen test, and I find in my notes made at the time that glycogen, according to Michaels, had been detected in the saliva by Salomon, and that other carbohydrate substances—for example, glucose—had been detected by Lecorche, Pavy, Lehmann, Jordeo, Nasse, Koch, and Gorup-Besanez, and that Arthus had determined the presence in the saliva of erythrodextrin, achroodextrin, and of maltose, and Michaels says: "I have myself determined the presence of sugar in the saliva of diabetics. Glucose takes a red coloration with Nessler's reagent, which passes into a grayish blue."** He says, further: † "The difference of opinion relative to the passage of sugar into the saliva and the perspiration is explainable as follows: Sugar passes with difficulty in the saliva, and it is not apparent in appreciable quantities except in pronounced diabetics. The saliva contains large quantities of bacteria, and unless certain precautions are taken the contained sugar disappears by fermentation. The albuminous substances may interfere with the fermentation. According to Claude Bernard, cane sugar injected into the blood does not pass into the pathological saliva." "The saliva of diabetics is found to be acid by the presence of lactic acid."

The presence of a fermentable carbohydrate as a part of the salivary composition is a question of fact which, despite the statements of the authorities quoted, needs to be fully investigated both qualitatively and quantitatively in the light of the importance of its bearing upon the question of the etiology of dental caries. That the saliva, particularly of caries susceptibles, does contain a carbohydrate substance capable of reducing Fehling's solution and likewise capable of fermentation, I have determined to my own satisfaction. The bearing which this fact may have upon susceptibility to dental caries is as yet an indeterminate question, but one of such important significance as to demand thorough investigation.

From the beginning of my studies of this phase of the subject in 1900 I have always doubted the existence of glycogen in the saliva, or at least doubted that glycogen could

*Michaels, *Trans. Fourth Internat. Dental Congress*, vol. i, p. 333.

†*Trans. Third Internat. Dental Congress*, Paris, 1900, vol. ii, p. 89.

be the metabolic carbohydrate dissolved in the saliva as manifested by the tests employed by Michaels to detect its presence. The chemical and physical properties of glycogen are such as to practically exclude its presence from the saliva by a process of dialysis through the salivary glandular structure—and, so far as I am aware, no one has ever discovered that any of the salivary glands possess an independent glycogenic function. The activities of this dissolved carbohydrate, when it exists, correspond more closely to those of glucose than they do to glycogen, and that this metabolic carbohydrate in the saliva is a sugar, and not glycogen, seems to be strongly indicated by subsequent collateral investigation to which I shall refer later.

Miller undertook a series of experiments to determine whether the saliva possesses bactericidal properties, and if so whether *inter alia* the bactericidal properties of the saliva exist in a more marked degree in persons immune to caries than in those highly susceptible; in which connection he says:

“The saliva of immunes *as a rule* produces less acid by fermentation in a given time, especially in the first twenty-four hours, than the saliva of susceptible persons. The difference was, however, not constant, and I have sometimes found in the former case quite as high a degree of acidity as in the latter; and in some cases, indeed, the saliva of the highly susceptible person has produced less acid than that of a comparatively immune.”

And in commenting upon the following observation he says:

“We have here a factor which should not be altogether overlooked, although it is certainly not of sufficient importance to account for the immunity in one case and the susceptibility of the other. I am not quite prepared to state why the saliva of one person more readily undergoes fermentation than that of another, and shall reserve a further discussion of the question for a later occasion. Naturally the reaction of the saliva at the beginning of the experiment, as well as the presence of certain salts—in particular, carbonates—fluence the amount of free acid appearing in the first twenty-four hours.”

Unfortunately, the future occasion when Miller could focus his great mind upon this phase of the problem never came to him, though it cannot be doubted that, had he been able to further pursue the study, the puzzle which con-

fronted him would have been solved.

It is perhaps not difficult to appreciate just why Miller was not able to take the next step in the solution of this puzzle. When we consider the dominating influence upon his mind of the limitations of his own definition of dental caries, a definition derived from a long, painstaking and elaborate research; and when by that research he had demonstrated conclusively that the disease could be artificially reproduced in perfect conformity with the postulates of Koch, his teacher; and furthermore, when his scientific findings were quite in accord with not only all that was known from the standpoint of clinical investigation up to that time, and was therefore in conformity with popular belief—it would seem that, under these circumstances, nothing short of a superhuman intelligence would have entertained the thought that dental caries could be produced by any other method than that which constituted the discovery of Miller. But, notwithstanding all this, his close proximity to the discovery of a broader conception of the etiology of dental caries is indicated in connection with his comment upon his experiments on salivary fermentation, and it is interesting to note his comment thereon in which he says: "We have here a factor which should not be altogether overlooked;" but when he goes on to say, "*although it is certainly not of sufficient importance to account for the immunity in one case and the susceptibility of the other.* I am not quite prepared to state why the saliva of one person more readily undergoes fermentation than that of another, and shall reserve a further discussion of the question for a later occasion," it seems to me that, in the light of more recent developments in connection with our understanding of the process of carbohydrate metabolism and their probable bearing upon the causation of dental caries, this last-quoted comment of Miller's takes on the similitude of the stone which was set at naught by this master-builder in dentistry and which now seems destined to become the head of the corner of our understanding of the etiology of dental caries.

It is interesting to note in passing how the thought was in his mind with regard to the influence which certain of the contained saliva salts had upon the process of fermentation, and how that possibility had been worked out and determined by the subsequent work of Dr. Percy R. Howe, of Boston. It is also interesting to note, in the quotation which I have just made, Miller's recognition of the important bear-

ing which variations in salivary composition had upon the fermentation process, and it is from my point of view remarkable that he failed to see, even when he wrote what I have just read, that it was just because of this variation in the salivary composition that he was able to note certain exceptions to what he found to be otherwise the rule—that the saliva of the caries-susceptible person is more highly fermentable and produces a larger percentage of acidity as a result of the fermentation than does the saliva of the individual who is immune to caries.

From what I have directed your attention to thus far it is probably apparent that I regard the carbohydrate content of the saliva—meaning by that its contained metabolic carbohydrate derived from the blood—as being the pabulum which is split up into lactic acid by bacterial ferments in the mouths of caries susceptibles, and it is this metabolic carbohydrate in such cases, other conditions being favorable to the localization of the process, that is the factor which determines susceptibility to caries of the teeth. This view I have repeatedly stated both in papers and in discussions, and it is a view that I had hoped would be sufficiently suggestive to induce those with more leisure than I possess to investigate it scientifically. That the suggestion has not aroused a more pronounced interest among investigators I attribute to two causes: First, that the incubus of the idea that dental caries is wholly the result of the lactic fermentation of alimentary carbohydrate food debris is so weighty and impressive, that few if any are willing to look beyond it for the broader conception that will more fully explain the unexplained things about dental caries and the phenomena of susceptibility in relation thereto. Second, that our knowledge of the conditions which lead to the presence of fermentable carbohydrate substances in the saliva is extremely meager; and I might add a third reason, and that is, that we have not yet shaken off the obsession that immunity is to be accounted for by the existence of some bactericidal factor in the saliva of the caries immune—an obsession which apparently manifests considerable vital tenacity notwithstanding the fact that the mouths of caries immunes swarm with caries-producing bacteria.

Recent studies in an apparently quite unrelated field have served to throw a most important light upon the existence of fermentable carbohydrates in the saliva, and as a consequence a corresponding illumination upon the obscure

question of susceptibility to dental caries. Claude Bernard demonstrated, perhaps a half century ago, that when the floor of the fourth ventricle between the origins of the auditory and pneumogastric nerves is punctured, in a rabbit, sugar appears in the urine; since which time numerous observers have called attention to the glycosurias arising from disturbances in that region, particularly the region of the hypophysis cerebri; and recently Goetsch, Cushing and Jacobson* have experimentally demonstrated the controlling relationship which the posterior lobe of the pituitary body exerts upon carbohydrate metabolism.

These observers having first determined experimentally in dogs the limit of carbohydrate tolerance, noted a marked increase of carbohydrate tolerance after removal of the posterior lobe of the pituitary body, the increase running in some instances as high as sixty-six per cent. above the normal preoperative optimum. Following the operation the animals rapidly increased in weight by deposition of fat.

The marked increase in carbohydrate tolerance noted in the animals experimented upon by Cushing and his colleagues strongly indicates a corresponding increase in the sugar content of the blood as a result of the pituitary operation—the excess being finally stored up as fat. The normal glucose content of the blood is fairly constant at about 1 part in 1,000; if it rises to 2 parts in 1,000, sugar begins to make its appearance in the urine. (Starling.) Such glycosurias may be artificially produced by overfeeding upon sugars or by the injection of glucose in the circulation. If the increased carbohydrate tolerance observed after removal of or injury to the posterior lobe of the hypophysis cerebri results, among other things, in an increase of the sugar content of the blood, then we may fairly infer that sugar will make its appearance in the saliva by dialysis from the blood through the salivary glands into the mouth cavity.

The facts brought out by Cushing and his collaborators are broadly substantiated by the records of many clinical observers, all tending to show that profound disturbances of metabolism, and—what is most pertinent to our present contention—that disturbances of carbohydrate metabolism and concurrent glycosurias are associated with hypophyseal injury or disease.

Let us now consider these data in their possible dental relations.

**Johns Hopkins Bulletin*, vol. xxii, No. 243.

It is not necessary that I should do more than recall to your minds the well-established fact that interference with the normal evolution of the teeth of both deciduous and permanent dentures results in what we are accustomed to call pathological dentition, and that pathological dentition has been shown to be the prolific cause of a long category of pathological phenomena of a reflex nervous character ranging through headaches, convulsions, chorea, epilepsy, insanity, dementia praecox, disturbances of vision and of hearing, and a host of others too numerous to mention. Such phenomena, when they are of dental origin, are examples of more or less pronounced peripheral irritation of the dental terminals of the fifth cranial nerve, which has its deep origin in the floor of the fourth ventricle. The peripheral irritation is reflected back through the origins of the trigeminus to the roots of other great nerve trunks arising in the same anatomical region, thus developing pathological manifestation at the areas of distribution of the nerve trunks secondarily affected. Because of the close regional relationship of the hypophysis cerebri to the deep origin of the trigeminus, it requires no great stretch of the imagination to realize the possible, even probable, disturbance of the pituitary body in cases of pathological dentition.

But what about normal dentition in its possible bearing upon the problem under discussion?

We are accustomed to regard dentition as simply the cutting of teeth, the passing of teeth through the gums, a process that is repeated with periodic rests or interruptions of intervening time between the appearance of each tooth or group of teeth until the normal complement is in place.

While this view is in a measure correct, the more accurate conception of dentition is that it is a process of more or less continuous physiological activity extending from birth until and after the third molars have taken their normal position in the complete adult denture, at about the eighteenth year of life—a process characterized by periods of accentuated nervous stress coincident with the prorruption through the overlying gum tissue of each tooth that takes its normal place in the denture. In this long period of dental evolution, extending through childhood and adolescence, but few individuals escape without more or less evidence of nervous reflex disturbance at times closely bordering upon the pathological, while many overstep the normal line to a serious and sometimes fatal degree. We have, then,

in the dentitional process and its manifest periodic impulses of increased nervous stress, ample justification for the suspicion that hypophyseal irritation may be induced thereby, with the accompanying disturbances of carbohydrate metabolism that are now known to be the result of such irritation. The mechanism of the nutritional disturbance is in essential respects analogous to that now known to occur in pregnancy. Erdheim and Stumme,* in a study of the alterations in the hypophyses of 150 pregnant women found that in nulliparae the average weight of the gland was 61.8 cgm., in primiparae, 84.7 cgm., with a maximum weight of 110 cgm., while in multiparae the average weight was 106 cgm., with a maximum of 165 cgm. After parturition a subsidence in weight of the gland occurs, involution being complete at the termination of lactation. It will be thus seen that an augmentation in the weight of the gland takes place with each succeeding pregnancy. The well-known functional disturbances of pregnancy presenting at times symptoms which Cushing describes as not unlike a transient acromegaly† are indications of pituitary disturbance; and he further says: "Pointing, too, in the same direction are the not infrequent glycosurias of pregnancy." Upon this latter point let me also quote an earlier statement of Cushing. He says:‡ "In a series of pregnant women observed by Reichenstein it appeared that out of ninety-three cases, 11.8 per cent. showed actual melituria, while in others a decreased carbohydrate assimilation limit, especially for levulose, was demonstrated. Indeed, a transient spontaneous levulosuria occurred in some of the cases after parturition." And he adds the following suggestive comment: "Doubtless comparable alterations in sugar tolerance occur in other periods of physiological readjustment. It is not unlikely that the glycosurias of adolescence may prove to be coupled in some way with deviations in the internal secretions which are on the border line of the physiological normal. In view of the occurrence at this period of life of a rapid increment, particularly in skeletal growth, it is a natural conjecture that these glycosurias may be related as closely to a hypophyseal

*Erdheim u. Stumme: "Ueber die Schwangerschaftsveränderung der Hypophyse," *Beiträge z. path. Anat. u. z. allg. Path.*, 1909, xlvi.

†Harvey Cushing, M.D.: "The Pituitary Body and Its Disorders," 1912, p. 243.

‡Goetsch, Cushing and Jacobson. *Bull. Johns Hopkins Hosp.* No. 243, p. 186.

hyperplasia as to the more obvious changes of the interstitial cells of testis and ovary which occur at this time. But the facts already established make a sufficiently connected story to justify the avoidance of speculation."

I have endeavored to bring to your attention the significant facts that through disturbances of the hypophysis cerebri more or less profound alterations are produced in the normal metabolic processes, and that these disturbances are connected not only with disease or injury of the hypophysis but are induced by the physiological stimulus of pregnancy, and, as I am forced by the collateral evidence to believe, they are induced also by the stress of dentition. I believe also that in view of the glycosurias that are in many cases symptomatic of these disturbances, we shall find that the recorded appearance of a fermentable carbohydrate in the mouths of caries susceptibles will be found to owe its presence to the same set of causes that in similar cases account for the presence of glucose and its congeners in the urine. Indeed, if the principle laid down by Michaels is true, that the composition of the saliva gives a more accurate picture of the chemical composition of the blood from which it is derived than does the urine, we should expect to find sugar in the saliva sooner in a case of approaching glycosuria than in the urine. Given the fact that glucose is a constituent of the normal blood plasma, and that under conditions of metabolic variation not only a hyperglycemia causing glycosuria, but overflow of sugar into the saliva may occur, then we have not only another light upon the etiology of dental caries, but, what is of equal if not greater moment from a practical point of view, we have the basis for the solution of the vexed problem of susceptibility and immunity to dental caries.

Let me direct your attention to an aspect of dental caries that has not, so far as I am aware, received the serious consideration that it deserves. The direction of progress of dental caries is from the free surface of the tooth toward its interior, until finally the pulp chamber is invaded. If we examine under the microscope a section of carious dentin cut parallel with the tubuli, we find the bacterial invasion proceeding pulpward from the dentino-enamel junction. The sectional area of the tubules nearest the enamel shows greatest enlargement and is packed with organisms, whereas that portion farthest from the enamel junction gradually tapers off until at the extreme limit of bacterial invasion the lumen of the tubule is so narrow as to contain but a single

micrococcus. If dental caries is dependent upon the lactic fermentation of alimentary carbohydrate debris, how is it that the direction of advance of the bacterial invasion is away from the source of food supply rather than toward the food supply? I am aware that the diastasic action of ptyalin has been called into service in explaining this phenomenon, and that the resulting sugar is assumed to be carried to the advance guard of the invading bacterial host by osmosis. This explanation is plausible, but it does not quite satisfy; for it is a general biologic law that the localization of living organisms is primarily conditioned upon proximity of a food supply; the great migrations of the earth's fauna, and indeed, the distribution of man himself, have been determined by the source of food. When we consider the carious process in the light of this broad biologic generalization, and when, especially, we consider that the blood plasma itself in caries-susceptible individuals probably contains an amount of sugar above the physiological normal, then it seems rational to conclude that the blood plasma, or its equivalent in the juices of the dentinal fibrillæ, can furnish a sufficient amount of carbohydrate material for the nutrition of caries-producing organisms.

Referring to my quotation from Miller* in which he calls attention to the fact that "The cause of fermentation depends frequently more upon the substratum than on the micro-organism," and that "Bacteria which grow upon white of egg, producing an intensely offensive smell and strong alkaline reaction, when brought into carbohydrate exhibit entirely different phenomena, viz., acid reaction and total absence of bad smell," this observation, involving the modifying effect which the pabulum has upon the activities of certain bacteria, has been fully substantiated by the work

**Dental Cosmos*, vol. xlvi, p. 859: "Some Recent Contributions to the Study of the Decay of the Teeth."

†(a) "The Influence of Environment upon the Biological Processes of the Various Members of the Colon Group of Bacilli," by Adelaide Ward Peckham, *Journ. Exper. Medicine*, vol. ii, 1897, p. 549.

(b) "Modification of Method for Determination of the Production of Indol by Bacteria," by Theobald Smith, *Journ. Exper. Medicine*, vol. ii, 1897, p. 543.

(c) "Studies in Bacterial Metabolism." (Kendall, Day and Walker.) *Journ. Amer. Chem. Society*, vol. xxxv, 1913, No. 9, p. 1201.

of more recent observers.† It is well known, for example, that certain bacteria of the colon and the proteus groups will develop or thrive upon either a proteid or a carbohydrate pabulum. Thus if a peptone sodium chlorid pabulum be infected with organisms of the type under consideration, the enzyme produced under the circumstances will manifest proteolytic properties by the development of indol in the culture medium. On the other hand, if to the same pabulum be first added, say, 1 per cent. of glucose, no indol will be produced, the glucose exerting a protective action which prevents the decomposition of the proteid because of the selective quality of the carbohydrate for which the bacteria concerned show a characteristic preference. It is of interest in this connection to note that the majority of acid-producing bacteria concerned in caries of dentin will grow upon blood serum.‡

The now established fact of variation in the sugar content of the blood in connection with pituitary disturbance would seem to necessarily indicate a corresponding modification in the activities of caries-producing organisms in connection with the destruction of the contents of the dentinal tubuli, and make reasonably clear why it is that the same bacteria may be responsible for the destruction of the protein as well as of the carbohydrate material which together constitute the make-up of the tubular contents.

If experimental investigation should determine the conditions to be as I have here outlined, then the original statement as to the etiology of dental caries made by Underwood and Milles would take on a new and important significance, for we should find as a matter of fact, as I have quoted from them in the beginning of this paper, that "The organic fibrils upon which the organisms feed and in which they multiply are the scene of the manufacture of their characteristic acids, which in turn decalcify the matrix and discolor the whole mass."

And furthermore, the question of food habit in its bearing upon susceptibility to caries will be found to involve more than an empirically balanced ratio of carbohydrates to proteids in the dietary on a calorimetric standard; it will involve also the factor of carbohydrate tolerance in determining the nutritive balance of these food principles as related to varying individual needs.

†See Goadby: "The Mycology of the Mouth," Longmans, Green & Co., 1903.

In closing this lengthy presentation, let me say that my purpose has been to put the problem of dental caries in such a position that it may be studied from a different angle of view from that which has characterized our mental attitude ever since the disease has been seriously studied at all. And I wish to lay particular stress upon the important bearing which some of the later work in relation to the physiology and pathology of the ductless glands evidently has upon the central problem of dentistry—viz., the causation of dental caries.

And, finally, I wish to record the suggestions embodied in the paper as the protocol of a research which I am now organizing in the hope of experimentally determining the truth or error of the doctrine set forth, and which I hope may ultimately help to further clarify our knowledge of dental caries.

Discussion of Dr. Kirk's Paper.

HAROLD CLARK, D.D.S., TORONTO.

T may not be out of place for me to explain why we have been honored to-night with the most interesting and scholarly paper that Dr. Kirk has just read to us.

A little over two years ago a few of us here had the pleasure of having Dr. Kirk dine with us one evening. During the conversation, being all dentists, shop talk was inevitable. Our guest was led into the field of original research and he told us many things of interest, particularly in the matter of diet and its probable relations to dental caries and oral sepsis. Some time after, I made bold to write Dr. Kirk and tell him some of my own observations and ask him some further questions. I also asked him if he might be prevailed upon to come and read us a paper elaborating with further detail the interesting subject that had been touched upon lightly at the dinner. Knowing, as you all do, how busy a worker Dr. Kirk is, you can understand my surprise and pleasure when he replied that out of loyalty to his scientific and professional standards he didn't see how he could decline the invitation. And so, gentlemen, he is with us to-night, and I know that we all appreciate his presence and his most excellent paper as nothing less than a very great kindness.

As for opening the discussion of this paper, I was a very bad choice for the task. While it deals in some measure with the diet factor in the etiology of caries, it soars into the regions of physiological chemistry and the physiology of the brain; regions with which I have barely enough acquaintance to follow the argument intelligently, but far too little to discuss it along those lines. I am pleased to see Professor MacCallum with us, as we all know that he is something of an intellectual aviator himself. It is a paper that should be specially interesting to the college man, and I am glad we have a few of them here to consider the subject and discuss it from that side. However, as a practising dentist, there are some points I would like to enlarge upon, and at Dr. Kirk's suggestion I will cite some cases from my own clinical experience.

Our everyday work as dentists is of great value to the community. All propaganda teaching the prophylactic care of the teeth is good. It is always good, and good for all; but it is the Little Hero of Haarlem holding his finger to the leak in the dyke, and no one coming to stop the leak. Assuming the validity of Dr. Kirk's contentions, which are so ably backed up by Pickerill and others, it looks as if we may have the matter of caries susceptibility within our control. Here will be a new gospel which will so enlighten poor civilized man that he may be able to rival the savages of the South Sea Islands in the health of his mouth, and with it all his general health. And it will be up to the dentist to spread that gospel. Here recently we see that Sir William Osler has come forward with another sweeping statement—that the next great thing in the matter of public health is coming from the dentist; and the statement doesn't seem to have met with the criticism called forth by other historical assertions he has made. I wondered who could have told him, and then I remembered that he and Dr. Kirk had been college associates and that Dr. Kirk had recently been in Oxford. So I had strong suspicions that it was he who had put the great physician wise to what the dental profession holds in its hand to-day.

Dr. Kirk, at the dinner referred to, suggested the probability that the over-ingestion of carbo-hydrates is responsible for a return of that class of food to the mouth by way of the circulation in a digested or soluble form resembling glycogen, and that this element in the saliva rendered it a very fertile culture medium for the proliferation of patho-

genic germs in the mouth—the resulting presence of lactic acid supplying the conditions that, probably, account for the decay of teeth.

From my clinical experience, I think we may clear the ground and go a step farther and make sugar the main culprit, with starch as an accessory.

Sugar, i.e., commercial sugar, is as artificial product as morphine or strychnine or cocaine. It is an element or part of a vegetable substance separated or freed from all the rest of that vegetable substance. And just as each of the alkaloids referred to makes a characteristic impression on the person using it, so also does sugar express itself in a characteristic way, and it is my impression that this characteristic may have an important bearing on the problem before us. Sugar has this peculiarity: it is so attractive to the human palate that it is eaten away beyond the promptings of hunger, if inclination is followed. And, likewise, foods made rich with sugar are taken far beyond the hunger limit. By way of illustration: After eating a meal of good plain food that satisfies hunger, we all know how easy it is to go on and eat sweetmeats or a sweetened pudding. If, instead of sweetmeats or the sweet pudding, properly boiled rice, made palatable with salt and some spice, like curry, were substituted there would probably be no inclination to eat it.

The inference to be drawn from the above is obvious. Without sugar, hunger would probably determine for us the proper amount of carbo-hydrate food for our needs. Or, taking the converse, with sugar there will probably be over-ingestion of carbo-hydrates, the surplus finding its way back to the mouth, fertilizing and multiplying the lactic acid-producing germs until the alkalinity of the saliva is overcome and the mouth becomes acid. If any unconverted starch debris remain in the mouth, the free acid destroys the action of the ptyalin and prevents its being converted and leaves it to fasten itself to protected and susceptible surfaces of the teeth, thereby establishing foci of decay. And if a soluble hydrate in the circulation finds its way into the saliva, it surely is most reasonable to look for it in the moisture of the dentine, which is derived from the circulation in the pulp.

My experience in a clinical way has led me to the conviction that sugar, far more than starches, must be the really responsible factor of carbo-hydrate food in caries susceptibility. For years I have enquired into the diets of patients,

especially those exhibiting the extremes of immunity and susceptibility, and long before I heard Dr. Kirk enunciate the theory that susceptibility was mainly due to the presence of a soluble carbo-hydrate in the oral fluids derived from the circulation, I was convinced that the baneful action of sugar was in some way after ingestion. For it is practically impossible to retain sugar in the mouth long enough for fermentation to take place. My idea was that it probably returned in some *obscure* way in the saliva; but the statements of Dr. Kirk at that dinner two years ago, the facts and probable facts set forth in his paper to-night, the investigations and conclusions of such men as Pickerill, Wallace and others, make it very much less obscure. The teachings of these men, backed up by my own clinical observations, convince me that we are probably on the threshold of such knowledge that will put the matter of caries susceptibility under voluntary control in all but certain pathological cases. It will then become a matter of educational propaganda; and it doesn't require a very vivid imagination to see enormous possibilities for the well-being of civilized humanity, and to understand Osler's statement that the next great thing in the matter of public health is coming from the dentist.

A few days ago I received a letter from Dr. Kirk in reference to the paper he has just read, and the discussion of it, and he suggested that he would be interested in the recital of any cases having a bearing on caries susceptibility. I shall refer briefly to a few.

Case A.—I will commence with my own. My grandfather was a large producer of maple sugar and syrup, and in our family, during my boyhood, these delectables and all good things made from them were simply *ad lib.* Before I was twenty my dentist told me that before I was thirty I would be wearing plates. That misfortune, thanks to much dentistry and faithful prophylaxis, I have escaped. But, until my convictions as a dentist led me to cut down my sugar consumption, I had an annual average of about five or six spots of caries on my teeth. During the last six or eight years I haven't had any caries whatever. Broadly speaking, my susceptibility to caries has been in the direct ratio of my sugar consumption. It would take some direct and convincing evidence to make me believe that my present immunity is simply due to the fact that I am passing through one of the much-talked-of "immune periods" of my life.

Case B.—The next case is that of my own children. Not only had their father carious teeth during his childhood, but their mother was likewise unfortunate. If heredity plays any important part in susceptibility my children should have no chance of escape; but as a matter of fact they are practically immune. I am quite within the mark, however, when I say that their sugar consumption is not 10 per cent. of what their father's was; and, parenthetically, their general health in the matter of colds, stomach disorders, etc., is about as near the ideal as one could wish.

Case C.—A young man about 35. His appearance would suggest better than average general health. An experienced dentist would expect to find him the possessor of at least a fairly healthy mouth, and not more than the average evidence of caries. Instead, I found quite the most appalling condition I ever saw behind any man's lips. He had practically all his teeth, and there were scarcely any free from caries. Some of them had whole surfaces so carious that it was impossible to make the affected part into a cavity. I immediately put him through a catechism as to his diet. Had he been a young woman, I should have begun with the candy box. His diet, i.e., his table diet, was at least usual, if not normal, and offered no explanation. I asked him his business. He was a confectioner. I asked if he every tasted his wares. He replied that he was eating them all the time by way of testing the output. The inference is obvious.

Case D.—A friend of mine asked me to look at the mouth of a new office boy he had, whose teeth, he said, were very bad. He was a lad of fifteen, and when I examined him I found 28 as perfect teeth as I ever expect to see, but they had an unusual display of a blackish brown tartar or stain in all the interproximal spaces. It was this stain that led his employer into thinking that the teeth were decayed. I enquired into his diet. There was an unusual absence of sugar in it, but far too much proteid food. Meat and cheese figured largely in all his meals. Otherwise his bill of fare was very plain. Perhaps Dr. Kirk could tell us if the proteid food and the unusual stain on the teeth bore any relation of cause and effect.

Case E.—Another young man of about 35. For about ten years I had cared for his teeth, and they were above average on the side of immunity. After about a year's absence from my care he returned and complained of either cavities at the necks of his teeth, or else hard tartar, as he could catch

his finger nail in them. I found his molars and bicuspids on the left side almost girdled with narrow bands of decay at the gingival margins. The right side was much less affected for some reason. I enquired about his diet; asked if he had been ill, or taking strong medicine. Nothing seemed to explain the unusual condition. He asked me if giving up smoking could be the cause. While I was explaining that it would probably make no difference in the matter, a sudden thought came to him. "Could it be this?" he said, pulling out of his pocket a small box, with little confections in it, and he explained that ever since he had given up smoking, over a year previous, he had kept one or two of these in his mouth whenever he had the inclination to smoke, and usually went to sleep with two or three in his cheek. I asked him if he had a habit of sleeping on any particular side, and he said that he always lay on his left side. This fact may or may not have had anything to do with the trouble being almost confined to the one side, but it was at least interesting to note it. I have little doubt that his confectionery substitute for the pipe was the cause of his trouble.

Case F.—Another interesting case was that of an old man who died recently at the age of 84. I cared for his teeth during about the last 12 years of his life. When I commenced to work for him he had an unusually good lot of teeth for a man of his years. For six or seven years I had little to do for them. At about his eightieth year his teeth began to trouble him, and me, too. His mouth had become very unclean, and his breath had acquired a very offensive and sweetish odor. He also seemed to have developed some pharyngeal or laryngeal irritation, for he was constantly clearing his throat and keeping up a small cough. I was attributing it all to senility, and was simply doing what I could to make him comfortable. One day as he was getting into the chair he removed from his mouth a small confection composed of sugar, licorice and other things. I made enquiries, and learned that for a year or more he had kept one of these almost constantly in his mouth to allay the irritation that made him cough. I have no doubt now that they, in an indirect way, greatly aggravated the irritation.

Case G.—A man of about 48, who, after years of unusual immunity to pyorrhea, suddenly exhibited several carious teeth. I began to probe for sugar in his diet. He confidently told me that I would have to guess again, as he wasn't fond of sugar, and left the candies to the ladies. I enquired more

intimately, and ran over the list of possible sources of sugar—jams, marmalade, syrup, honey, etc. As soon as I mentioned honey, his wife, who was standing by, exclaimed: “Honey! Why, George just lives on honey!” He had a year or more previously discovered something special in the honey line, and, being fond of it, had been eating large quantities of it.

Case H—is one of a type that interests me most of all. One of those young people with carious teeth whom you can interest enough in their teeth to make them eager to follow faithfully and continuously the diet and regimen you lay down, and give you the opportunity to observe results. The one case of this type that I will cite was a young growing girl of 16. She came to me with an aching tooth. I cared for it and pointed out that she had about a dozen other cavities that needed attention. There was ample evidence that she had had much experience in the dental chair before she came to mine. Enquiry into her diet revealed the fact that she and her mother specialized in home-made candy, of which she was very fond, and she confessed a liberal use of sugar and sweet things generally at the table. Next visit her father accompanied her. He explained that four months previously her teeth had been filled and made all right, and he had paid a bill of \$40. He told of his limited means, and that, in consequence, he could not afford such expense, and wanted to have me remove the affected teeth. I explained that that was impossible, but that if he and his daughter would undertake to carry out faithfully the diet I would prescribe for her I would undertake that in six months there would be very little to do, and that in another six months there would be less. I had ample confidence in the spirit of the girl to do her part. It is nearly two years since I first saw the girl, and after the first seven months I found two small cavities. I have seen her twice since then, and there has been nothing to do either time. I may add that there is a marked improvement in her appearance of health and well-being. But perhaps she has just entered a period of good looks as well as a period of immunity, and diet had nothing to do with it!

Case I.—I shall trespass upon your patience with but one other case. It illustrates a point that has been interesting me for some time, and I trust it is not irrelevant to the subject before us.

Pickerill, in his well-known book, “Prevention of Dental Caries and Oral Sepsis,” discusses the diets of immune

races, and it must have occurred to you that have read the work that the most immune races indulge in the use of what he calls "masticatories"—a much nicer term than chewing gums, and no doubt would remove much of the objection to their use! By way of giving my little five-year-old daughter supplemental mastication to develop the alveolar tissues, I gave her tamarac gum to chew for fifteen or twenty minutes after meals. I experimented with it myself, and observed the profuse secretion of saliva during mastication. I tested the saliva induced in this way, and found it always very alkaline, even though the mouth were acid before using it. I noticed that it left the mouth very clean, and assumed that the diastatic action of the saliva secreted had converted the insoluble starch debris into the soluble dextrose, and that I had swallowed it. I have been prescribing it for those cases that we all so well know, where the teeth are coated with a substance resembling half-boiled starch. The results, so far as I have been able to make observations, encourage me to think the practice may be of value. The case I wish to speak of specially in this regard is a young man whose teeth are always more or less in this condition. He came in the other evening just before I was leaving my office. I noticed that his teeth were badly coated, and as we were walking home together I saw an opportunity of making an observation. I had him chew this tamarac gum during the time we were walking—perhaps 25 minutes. I had him step into my house, and I examined his mouth. There was scarcely a trace left. Of course it is obvious that the use of a masticatory leaves no debris behind it; and the act of chewing tends to remove the debris of previous mastication, both mechanically and chemically. The notion of "after-dinner" gum-chewing gives one something of a shock; but may there not be some prejudice involved? I can believe that there are those present who could be convinced that it should be quite as elegant as after-dinner smoking!

Discussion of Dr. Kirk's Paper.

PROFESSOR A. B. MACCALLUM, F.R.S., Sc.D., TORONTO.
Department Biological Chemistry, University of Toronto.

CHE subject discussed in Dr. Kirk's address is a very difficult one. There are so many factors involved in the causation of dental caries that it is not possible to be comprehensive in a discussion of all the points involved. Dr. Kirk has, however, drawn attention in a striking

way to one point of view which will cause those who are fixed in their ideas as to the origin of dental caries, to reorient themselves, and for that very reason his contribution is very valuable.

His suggestion that the causation is the production by bacteria of lactic acid from carbohydrates in the mouth may, perhaps, be accepted so far as one phase of the caries is concerned. It is not, however, the only cause, for there are others which are more fundamental than that. There is the factor which diet develops. There has never been any doubt that diet does affect the teeth, and, in this connection, we have some evidence derived from the analyses made by Gassmann, of the teeth of prehistoric man and of the teeth of man of the present day. It has been found that prehistoric human teeth contained more calcium and less magnesium than the teeth of the human subject of the present day. That alone postulates that our teeth are softer, much more friable, more easily disintegrable, than were the teeth of our very remote ancestors, and the only explanation possible for this difference is that the diet was different, and we know that it was.

It has been pointed out by German military physicians that the recruits from districts in which the drinking waters are charged with calcareous salts, as a rule have very good teeth. This observation is, perhaps, not quite satisfactory in all respects because the waters of Salkammergut, that is the district adjacent to Salzburg, are loaded with calcareous salts, but the inhabitants of the region are markedly prone to dental caries.

In any consideration of this subject we would have to group the factors in two classes: (1) Those which operate within the teeth; (2) those that affect caries from without. Of all those that operate within the teeth, the chief are due to disturbances in the general metabolism which tends to affect the nutrition of the different tissues. It is generally accepted that the poorly nourished in young life exhibits a tendency to develop dental caries. This involves the metabolism of carbohydrates, which has been emphasized by Dr. Harold Clark.

It is quite possible that an abnormal quantity of carbohydrates in the blood may disturb the composition of the teeth, either directly or through derangement of the biochemical processes of the tissues generally, thus disturbing the balance on which the interplay of the tissue depends for their normal development. That such disturbances of the

balance may result seems to be indicated by what one finds in diabetes mellitus. In this disease the teeth manifest a decided tendency to caries.

Then there are the effects of certain lesions of the hypophysis cerebri which have been referred to by Dr. Kirk, but the most striking illustration of the dependence of the normal condition of the teeth on tissue metabolism is furnished by the removal of the parathyroids. When these are removed in an animal, the first symptoms are those of tremor and weakness. The animal cannot stand, owing to the irregular contractions that occur in the muscles of the body, a condition which has been named tetany. The animal, as a rule, does not live long after the removal of these organs, but rats can be kept alive for from six weeks to two months after the operation. During this time there is a marked loss of the hair. There is, also, eczema, but above all, a marked decay of the teeth. Opaque white spots develop in the enamel, which then become carious. These increase in number; the parts affected dissolve away; the teeth break off very freely, and death may occur simply from the fact that the animal is unable to take its food because of its inability in this respect. It is evident that the internal secretion of the parathyroids influences, in some way at present unknown to us, the metabolic processes on which the normal nutrition of the teeth depends.

In pregnancy the metabolism is altered (how far, at present we do not know), but the internal secretions are involved, and of course this may account for the caries of pregnancy which occur in this condition.

Amongst the external factors determining caries is the constitution of the saliva itself. Jonas has determined that normal saliva is saturated with phosphate of lime and magnesia, and therefore it cannot dissolve these salts from the enamel; but when the saliva is not saturated with calcium salt, there is a tendency for the calcium phosphate in the enamel to dissolve. In the days when the cotton spinners had to moisten the cotton, as it was spun, with saliva, the latter ultimately became very dilute, and dental caries was common amongst the operatives.

Then there is the lactic acid-producing bacterium, whose action Dr. Kirk has discussed. It does not seem to rely wholly upon the presence of carbohydrates as a source for lactic acid. Certain forms of lactic acid-producing bacteria may derive the lactic acid from other sources than the carbohydrate. Propionic acid may be one of these, and we know that in the tissue propionic acid occurs as amino-propionic acid, ultimately derived from the digestion of proteins in

the intestine. Of course the bacteria will produce lactic acid from carbohydrate, if it is present in the saliva, but the quantity of such a carbohydrate accessible to the bacteria in the carious spots cannot suffice to produce enough acid to dissolve out, except very slowly, the lime from the enamel and dentine. On the other hand, mucin, which has a carbohydrate atom-group in its molecules, may very well serve as a source for the lactic acid that dissolves the enamel in a carious spot. I recall that some observer, whose name I have forgotten, has succeeded in cultivating the *bacterium aerogenes lactis* in a carbohydrate free medium, but containing mucin, with the result that lactic acid was formed.

Discussion of Dr. Kirk's Paper.

ALBERT E. WEBSTER, M.D., D.D.S.

Dr. Webster said that Dr. Kirk had brought the attention of the profession to a new idea in connection with the cause of dental caries. Miller and others had held that dental caries was caused by the fermentation of carbohydrate foodstuffs, in contact with the surface of the teeth. Dr. Kirk's view was that the excess of carbohydrates taken into the body was excreted in the fluids, urine and saliva. It was this excreted carbohydrate which was constantly present in contact with the teeth that supplied the necessary elements for the development of lactic acid.

Dr. Kirk also presents the idea that any interference with the pituitary body was the cause of an excess of carbohydrate in secretion; hence, such disturbances as dentition, pregnancy and diabetes are important factors in the cause of dental caries.

He said that the most immune period in childhood was the period up to three years of age, when there was the greatest disturbance of dentition, and also that first pregnancies were usually harder on the teeth than subsequent pregnancy. These two clinical facts hardly coincide with the theory set forth by Dr. Kirk. Decay of the teeth, in many cases, rather tends to spread than penetrate towards the pulp, which rather combated the idea that the element causing decay might be carried to the tubules of dentine by the pulp.

The discussion of Dr. Kirk's paper was continued by Doctors W. H. Doherty, Perfect, Pepler, Struthers, Wright, Geo. W. Ross, R. G. McLaughlin, H. C. Clarkson, F. A. Clarkson, McPhedran, and others.

Dr. W. E. Willmott, President of the society, was in the chair.

Our Buffalo Letter.

—
BY HABEC.
—

WE extend our nineteen hundred and fourteenth greeting to our Canadian friends, which also includes the compliments of the season. And now that 1913 has been shoved over the precipice of time and into the yawning chasm along with the other nineteen hundred and thirteen, let us stand upon the threshold of 1914 and gaze into the beckoning fields of imagery and enjoy the entrancing prospect, as oftentimes we have in yesteryears, of happiness unalloyed and great achievements to be gained. As has been the case since time immemorial, we are ever ready to excuse the shortcomings and disappointments of the old year, and equally ready to promise a complete fulfilment, in the new, of everything we had hoped to realize in the one last past.

Human nature seems ever the same, always unsettled and ever ready to turn from the old to the new; to follow its fresh, young form, and to acclaim it fairest of them all. It is well that it should be thus; otherwise, prospect, ambition, hope, and all that keeps us eternally striving for the unattainable, would lose their charms, and the story of human life would be written in black despair.

We rise up to be knocked down, and rise again with a smile for the conqueror. And so we come up smiling into the alluring face of 1914, knowing full well that the same old cuffs and blows will be ours, and with added vigor. It is the story from the cradle to the grave. But, on the other hand, we have an equal right to look for pleasure and happiness from the new year. This is under our control far more than reverse conditions. After all, the source of our happiness is from the eyebrows up, and we are to be pitied if we cannot dig a little joy out of the brain cells. Each one of us may be happy in proportion to our resourcefulness, rather than because of happy environment.

In applying this idea to us as dentists, the suggestions which Habec craves your permission to make, as adding to your already bountiful supply of happiness, are to make your offices more pleasant, if possible. Increase the brightness, keep all rooms filled with fresh air, be even more vigilant in cleanliness, and make the place in which you spend the greater part of your working hours just as attractive to *yourself* as possible. And, further, increase in the exercise

of charity. Try to do more this year than last for the helpless waifs who must depend upon us for the meagre attention which their mouths receive, and spread abroad the knowledge of mouth hygiene. The new year should go down in history as having accomplished more for humanity in the field of mouth hygiene than all previous years combined—and it must come through individual effort. *You* are one of those individuals, so get busy.

PROGRESS IN DENTISTRY.

This was the subject of a toast to which Habec responded at a dental dinner recently, and has called to his mind some of the developments during his own experience. A quarter of a century was a mere bag of shells to our old friend, Methuse, but to us it is quite a bunch of cycles. Yet it covers changes that are almost inconceivable. How well Habec remembers his first preceptor! He was a wonder. In versatility he was the original exemplification. In order of their significance he was, first, horse jockey; second, livery-man; third, farmer; fourth, card shark, and fifth, dentist. The office sported an old Archer chair, a few excavators and hand-drills, forceps, vulcanizer and rubber file. Even a foot engine was a minus quantity. However, strange as it may seem, he was rated as a dentist of some standing in the community. When Habec completed his "studies," he was the conglomerate result of the five characteristics of his example. Needless to say that his knowledge of the horse's dental architecture was much greater than that of the human. He was then turned loose on the unsuspecting rurals with a little case of cast-off instruments, and told to "fish or cut bait." O, how the accumulated sympathies of twenty-five years goes out to the long, lean blacksmith, who, up to this time had bore the reputation of a good citizen and a Christian. It was Habec's first gold filling that wrought this good man's ruin. It has since been our earnest prayer that Saint Peter was busy at something else, and failed to observe the uproar that was created about the little rural hamlet, hidden away in the verdant hills. It was a small mesial cavity in a lateral incisor, entirely innocent of its great influence upon the destiny of one of God's creatures. The real tragedy began with the attempted introduction of the gold cylinders. The jabbing, poking and scraping process of cavity preparation, although excruciatingly painful, was just a curtain-raiser for the big show. Pellet No. 1 rolled over when effort was made to drive it into the anchorage pit, and tumbled out onto the floor. Intervening up to

forty did likewise. At last, aided by determination and perspiration, a foolish piece hesitatingly clung to the pit and a second one was added, each one hammered with the automatic mallet until cohesion had been destroyed. Mutual exasperation was rapidly accumulating as piece after piece refused to grasp the already burnished surface, until the livid veins of the village smithy were at the bursting point, and the brawny muscles of the powerful hands and arms began to knot and twitch as a panther might just before leaping upon its prey. Habec could see something coming his way about that time, and began to flee; but he was just a little too slow for the equine pedicure who, with a great disgorgement of seven-colored imprecations, tore the rubber dam from his oath factory and jumped for his well-meaning malefactor, and no doubt would have crushed out all the progress in dentistry which Habec has since realized. Only his early training in side-stepping two older brothers saved Habec from complete destruction. After the odor of the burning language had passed away, and a sanitary state of atmosphere was restored, Habec was allowed to view the remains of his depredations, and after some difficulty he located the ravaged tooth several points to the southeast of its original position and in an entirely different latitude and longitude. Habec has never ceased to be thankful that he was not the next horse to be shod by the irate smithy. But our chest continued to expand with laudable ambition, and we advanced in due time from a fence corner tooth puller to a high-class extractor, who swept over the countryside and made edentulous all the old ladies for miles around. Accompanied by a physician who administered the anesthetic, Habec frequently, at the end of the day's devastation, could count an hundred peace-observing teeth added to his belt of trophies, four-fifths of which were crying out against his ruthless and wanton destruction—and may God forgive him, for no dentist will.

Progress in dentistry! What a travesty we have made of it through our benighted ignorance. But progress is fundamental and in all its branches dentistry is worthy to be placed in the vanguard of preventive medicine. It was begun as an itinerant trade and has broadened into an art and a science which is vigilantly guarded over by an army of educated and skilful men. The culminating feature of all art, all science and all progress is prophylaxis or preventative dentistry, and makes us worthy the name of benevolent profession. We humbly dedicate our life to an effort to, in a small way, make amends for the havoc of our youth.

THE WAY IT IS DONE IN CANADA.

Here's where us Yanks (Yiddish for Dentist) put one over on "youse fellows." It happened in the bustling town of Welland, and was related to Habec by one of her prominent citizens. Being a barrister by profession and a prince by nature, the ludicrous side of the occurrence appealed to him. Recently, a client came to his office distributing blood from his mouth in a most generous manner, and between the splashes, told of having visited the dentist to have a tooth drawn. The ambitious Yank yanked the wrong tooth, and, upon discovering his error, removed the aching one. The victim stated that the dentist charged him but half-price for removing the good tooth, and felt that the said Yank had shown him great consideration thereby. Can you beat it?

HERE'S A NEW ONE.

Habec recently met an eastern physician who recited a case where it was necessary to operate upon the lower jaw for necrosis. Later on, the patient applied to a well-known New York dentist, who pronounced the operation unsuccessful, and informed him that he was affected with Adamantoma. Of course this disease is much worse than necrosis, and in consequence, the fee for the second operation was much greater. Evidently necrosis in Connecticut is Adamantoma in Manhattan. It is well to remember the term as it may come handy to use for your millionaire patients. It is surprising in these modern times how many things we lay to Adam. He surely started something.

HABEC.

Dr. Cummer's Article.

CHE series of articles by Dr. W. E. Cummer upon the subject of Anatomical Articulation will be continued in the February number. We are sorry to break the continuity of this series, but unfortunately lack of space has compelled the holding over of the balance of Dr. Cummer's material for the February and March issues.

Toronto Dental Society.

CHE next meeting of this Society will be held on Saturday, 31st January, 1914. The guest of honor will be Dr. Clyde Davis, Dean of the Lincoln Dental College, Nebraska. Dr Davis will present a paper upon the subject of "Silicate Cements."

Vancouver Dental Society President's Address.

By J. E. BLACK, L.D.S., D.D.S.

IN the fall of the year, men, as well as birds, seem to be subject to the getting-together impulse. With our feathered friends it is a necessity, and surely our getting together again is a duty and a pleasure.

Some might say, when they see the older members showing their unflagging interest by being present at the first fall meeting, that with them it is a habit. If so, it is a good habit, which leads to progress, and one to which the dental professions owes much of its advancement. Moreover, we would like to see the younger men acquire a habit. It is said that when the Osler family assembled at the old home to do honor to their mother on her one hundredth birthday, the distinguished physician said to her, "I would advise you, mother, to take a little wine every day." "Oh, my son," said she, "I'm afraid I might acquire the habit."

If I should direct my remarks in any definite channel this evening I could hardly do better perhaps than to say a few words to the young men of our profession.

If the young men, who have recently graduated and have become registered dentists throughout the Dominion of Canada, could realize the hearty welcome that is extended to them by the dental societies, they would have no hesitation in placing their names on the rolls and taking an active interest in the work. If your ideals are true, you are everywhere welcome.

This is essentially a young man's country. The physical vigor and the sanguine temperament of young men is one of the indispensable factors in the building of a nation. The enterprises upon which the development of our country depends are so many and of such magnitude that they require young men for their success.

Pluck and efficiency are everywhere in the ascendancy. The older men cannot, alone, bear the strain, though nothing must be permitted to retard the car of progress. In every avenue of life young men of brains and brawn and high ideals are needed, and nowhere, perhaps, are their services required more than in the practice of dentistry.

For the exuberance of your energy and the confidence that is yours, your presence in our society is desired. The

older men need you to pull them out of the ruts and to stimulate them again and to help them bear the burden of organization; and just in proportion that the dental society needs you, you young men also ned the uplifting influence of the society.

To every man who has taken an active interest in the Dental Society it has proved to be a post-graduate school. It is there that the high ideals acquired at college will be fostered. It is there that the over-confidence in the methods you have learned will be greatly restrained. It is there that you will be the companion and counsel of your elders, who, for many years, have travelled the rough road that now holds you upon the beginning of your journey. Remember the old adage, "Old men for counsel and young men for war," is as true now as it was in the days of old. Young men of our profession are as prone "as the sparks to fly upward" to chase after the *ignis fatuus* called "fads," and you know that *fads* are oftentimes worse than *ruts*. Now, the older men are wary of "fads," though not always weary of ruts, and with a grim smile on their faces they warn you, by pointing to the old furnaces and other relics of ideals tried and found wanting, and will likely tell you that your high-pressure syringe will occupy a prominent place among the other relics in the future.

It may be that the over-confidence of the younger men and the conservatism of the elder are both necessary factors; if so, it is here we should meet and unite our forces. Every meeting should be of such a nature that each man should feel he has acquired something useful in either the practical or the theoretical. If every man puts into it a cheerful interest we can assure him that he will be benefited in proportion; and whatever makes better and more efficient men will elevate the profession as a whole.

The man who isolates himself from other men of his profession is sure to become narrow-minded and most likely will become what is called a "knocker" and to underestimate the character and ability of his confreres.

It may be well for us to give a more practical bearing to our meetings. Practical demonstrations at some of them may be an excellent change, and any suggestions that will make the meetings of more interest will be gratefully received.

To the young men I shall say, in addition, that the public needs your services and all of the skill and ability you possess now and that you may add in the future is none too

good for the public whom you will serve. The world calls for the best that is in you. The future is in your hands. Whether in the years to come dentistry will rise to higher ethical planes and advance along lines of efficiency, depends upon you. Will you prove yourself recreant to the trust, or will you manfully shoulder the responsibilities and make the profession more ethical and more efficient than you found it?

Vancouver Dental Society.

CHE first meeting of the Vancouver Dental Society for the season was held in the form of a dinner, given at the Commercial Club, Wednesday, October 15, 1913, when the Society entertained as guest of honor Dr. F. Westbrook, President of the University of British Columbia. Dr. J. E. Black was in the chair. Dr. Holmes, of New Westminster, introduced the guest and forty members of the Society were present.

Mr. Westbrook traced the progress of the medical profession in the United States and Canada during the past eighteen years. The period of instruction had been extended and the number of subjects studied greatly increased. Similar development had taken place in dentistry, but Mr. Westbrook prophesied that in the future the present dental term of study would be extended materially.

Just as the improvement and advance in connection with medicine had been brought about by the medical associations and not by the general public, so the future of dentistry depended upon the dental associations, and Dr. Westbrook predicted that the advance of the future in dentistry would be along preventive lines rather than in curative measures. Dr. Westbrook referred to dentists as specialists—not mechanics—that are part of the life-saving machine, and standing side by side with physicians practising preventive medicine. He expressed the view that there is a need for closer co-ordination in the various seats of knowledge as there had been too much independence on the part of the learned professions in the past.

In referring to the scheme under consideration in Vancouver, that the dentist should give one half day a month to work in a public infirmary, Dr. Westbrook said that, while he thought it a fine work, he believed that all charity of any kind should be organized and that as far as possible payment should be made.

Dr. W. J. Curry referred to the need of maintaining high

ideals among dental students and of keeping the dental profession from becoming commercial in any way.

Among other speakers were Dr. McPhillips and Dr. McLaren. The meeting closed with a hearty vote of thanks to Dr. Westbrook for his excellent address.

The society held its next regular monthly meeting on November 12th at the Commercial Club. It was the best meeting in the history of the society, forty-five dentists being present and ten guests. The guests were His Worship Mayor Baxter, of Vancouver, Board of Trustees of the city, Mr. Gordon, Inspector of Schools, Presidents of the School Boards of New Westminster and North Vancouver, Medical Inspectors of Vancouver, South Vancouver, North Vancouver, and Point Grey.

The subject for the evening was Oral Hygiene and Prophylaxis, and the President in his opening address spoke in part as follows:

To Germany must be given the credit for having first taken steps to examine the teeth of school children. In 1899 a medical inspection of the German army revealed the fact that most of the neuralgia, indigestion, malnutrition and anaemia among the soldiers was caused by decayed and abscessed teeth, and steps were immediately taken to remedy the evil. From this, there grew the idea of examining the teeth of school children which was first carried out in Strassburg, where among ten thousand children examined 98 per cent. were found to have teeth in various stages of decay. This astounding result caused the other cities of Germany to take up the work, and it soon spread to several countries of Europe. In Ireland and Scotland out of 10,507 examined 86 per cent. had decayed teeth. In Milan, Italy, out of 12,012 examined 92 per cent. were needing dental attention.

The idea soon took root in America. Boston and its surrounding cities became interested and soon established the work on a firm basis. In New York City the subject was taken up with vigor and a thorough system established, dental inspectors being appointed for the schools. The report of last year from this city shows that more than twice as many children are needing attention, as there are for all other diseases put together. Dr. W. H. Maxwell, Superintendent of Schools for New York City, said:

“Malnutrition is the chief cause, not only of physical weakness, but of mental weakness, and is, no doubt, largely responsible for the dreadful ravages made by the various forms of tuberculosis. A badly nourished body furnishes a

poor support for intellectual efforts, and instead of being a barrier against, is a standing invitation to disease."

Canada was not far behind. Toronto took up the work in real earnest, and from there it has opened like a great beneficent wave east and west, and we trust as a result of this meeting, it will take some definite form here to-night.

To Dr. H. P. Minogue, Registrar of the College of Dental Surgeons of British Columbia, fell the honor of delivering the lecture of the evening, which he did in his usual splendid style, using many well selected slides kindly loaned by the C. O. P. A.

Before the School Board left the building they requested that a committee be appointed to wait upon them to devise ways and means of providing a school dentist, and as a result the year 1914 will see Vancouver with a salaried dentist with a fully equipped office in the medical department of the school offices. Any children in the future unable to pay dental fees will be well cared for. In the medical report of this year some three thousand children need immediate dental attention.

The Canadian Dental Association 1914 Meeting.

ABIG treat is being prepared for those who attend the meeting of the Canadian Dental Association in Winnipeg next May. As we go to press we have received a letter from Dr. M. H. Garvin, Secretary of the Canadian Dental Association, who has outlined briefly some of the plans of the committee and discussed at some length the question of the best date to hold the convention. Dr. Garvin has indicated that the Dental Association of Western Canada has withdrawn its meeting for 1914 that its members might unite in placing their entire support and energy at the disposal of the larger Canadian gathering. This association, at its convention last year, decided that in so far as the Western men are concerned the middle of May would be the most satisfactory date to hold the Canadian convention. Western men prefer an even earlier date, rather than a later one, so that the meeting will not conflict with their usual vacation plans. Many take their holidays at a time and in a territory that would make it impossible to combine holiday plans with the Winnipeg convention. Thus the later date

in May has been fixed by the committee as the one suitable to the majority of Canadians.

Dr. Garvin has also cleared up the question of tourist rates to coast points. The summer railway rates from Winnipeg to the Coast will be in effect immediately following the convention. The city of Winnipeg itself, of course, will be reached by means of the Standard Convention Certificate Plan.

It is quite impossible to suit every person in arranging a date for such a large convention. It will be necessary for some to sacrifice individual preference for the sake of the general good. There is, however, no fear but that the committee will be loyally supported in the dates they have chosen, namely, May 26th, 27th, 28th and 29th, 1914.

The convention programme is not yet in any way complete, but enough of the programme has been arranged to ensure a rare treat for those who attend.

PROVISIONAL PROGRAMME.

Business Side of Professional Life. Dr. Carson, a prominent lawyer of Calgary.

Problems Involved in the Standardization of the Color of the Human Teeth. Dr. Forrest Orton, St. Paul, Minn., Professor of Crown and Bridge Work, Dental Department of University of Minnesota.

Dr. J. H. Prothero, of Northwestern University, Chicago, a paper and clinic on some phase of Prosthetic Dentistry.

Dr. W. D. N. Moore, of Chicago Dental College, paper and clinic on some phase of Operative Dentistry.

Dr. Orton will also give a clinic on Crown and Bridge Work.

Splendid accommodation has been secured in the new Industrial Bureau with unlimited room for exhibitors and clinicians.

Every Canadian dentist should so arrange his plans that he may be present at this convention in Winnipeg next May.

National Association of Dental Faculties.

CHE Annual Meeting of the National Association of Dental Faculties will be held at the Iroquois Hotel, Buffalo, N.Y., January 26, 1914.

Executive Committee meeting 9 a.m.; general session at 10 p.m.

B. HOLLY SMITH, *Chairman Executive Com.*
CHARLES CHANNING ALLEN, *Secretary.*

Ontario Dental Society.

CHE Annual Meeting of the Ontario Dental Society will be held at the Dental College Building, Toronto, on Monday, Tuesday and Wednesday, 16th, 17th and 18th February, 1914. The provisional programme is as follows:

Paper—"Clinical Difficulties in Prosthesis." By Ellison Hillyer, D.D.S., Professor of Prosthetic Dentistry, New York College of Dentistry.

The Committee is endeavoring to arrange with Horace Fletcher to give an address upon the subject of "The Dentist and Preventive Medicine."

Paper—"Silicates."

Paper—"Direct Method of Making Gold Inlays."

Paper—"Indirect Method of Making Gold Inlays."

Authors for these three papers to be announced later.

Entire Tuesday morning to be given up to clinics by members of the dental profession.

The Exhibit Committee is arranging for an exhibit in the College by those firms not included in the Temple-Pattison Company exhibit.

Special Convention Rates on the Standard Certificate Plan are being arranged. TICKETS GOOD FROM THURSDAY, 12TH FEBRUARY, TO SATURDAY, 21ST FEBRUARY, 1914, INCLUSIVE. If less than 300 are present the rate will be a fare and a third, and if 300 or over, single fare.

The O. D. S. Programme Committee is planning to make this convention the largest and best in the history of the Society. Mark off the dates NOW, and visit Toronto during the BIG DENTAL WEEK in February.

Manufacturers' Exhibit.

DURING the same week of the meeting of the Ontario Dental Society, and in connection with the opening of their new building, 243 College Street, Toronto, the Temple-Pattison Company has arranged for a most extensive exhibit of dental goods on 18th, 19th and 20th February, 1914. This exhibit will embrace exhibits and demonstrations by over thirty prominent Dental Manufacturers, being a duplicate of the Manufacturers' Exhibit held recently in the city of Detroit. The entire field of dental manufacture

will be covered—Furniture, Teeth, New Model Outfits for Gas and Oxygen Analgesia, Instruments, Electrical Appliances, and general dental supplies.

Faculty of Lecturers on Oral Hygiene.

A MEETING of those who lecture to the nurses at the hospitals, women's institutes and other gatherings, private and public schools, etc., in the vicinity of Toronto, was recently held at the Dental College Building. The subjects of lectures and manner of giving them were gone into thoroughly. Dr. A. J. McDonagh was elected Dean of the Faculty, and Dr. Margaret Gordon, Secretary.

The following are the men and places where they will lecture during the coming winter:

At the Down-Town Church Workers' Association (Mothers' Meetings).

Holy Trinity Church—Dr. W. E. Wray.
St. Philip's Church—Dr. A. W. Ellis.
St. Mathias Church—Dr. C. E. Brooks.
St. George's Church—Dr. A. Day.
St. John's Church—Dr. F. G. Price.

At Factories During Lunch Hour (Y. M. C. A.)

Taylor's Safe Works—Dr. R. G. McLaughlin.
Hees Window Curtain Factory—Dr. J. E. Rhind.

Lectures to Nurses.

St. Michael's Hospital—Dr. A. J. McDonagh.
Methodist Deaconess' Home—Dr. Margaret Gordon.
Hospital for Sick Children—Dr. J. A. Bothwell.
Cottage Hospital (Miss Lash)—Dr. C. A. Kennedy.
Toronto General Hospital—Dr. A. D. A. Mason.
Weston Tubercular Sanitarium—Dr. B. O. Fife.
Home for Incurables—Dr. A. S. Thomson.
Western Hospital—Dr. C. H. Clarkson.
District Nurses' Training School, Church of England
Training School, Presbyterian Deaconess' Home,
Grace Hospital—Dr. R. G. McLaughlin.
Moulton Ladies' College—Dr. F. C. Husband.
Westminster Ladies' College—Dr. C. H. Clarkson.



PERSONAL PAGE



Dr. O. H. Zeigler, wife and daughter, of Toronto, have just returned from a two months' trip through the Canadian West, British Columbia and California.

Dr. R. H. Chant, Foam Lake, Sask., has been spending a month at his home in Lakefield.

Dr. F. A. Sellery, formerly of Hensall, Ont., has opened an office at the corner of Bloor and Bathurst Streets, Toronto.

While motoring near Galt, Dr. Foster Elliott, Dr. Alex. Elliott, and two others, of Toronto, had a narrow escape from serious accident as the result of a wheel breaking off. The car turned turtle and pinned the driver, Dr. Foster, under it, resulting in a bad shaking-up and a broken collar-bone. Dr. Alex. escaped uninjured. One of the others of the party had his leg very badly wrenched.

The dental profession will be sorry to learn that Dr. J. E. Wilkinson, of Edmonton (formerly of Toronto), was recently bereaved in the loss of his wife. Dr. Wilkinson may feel assured of the sincere sympathy of his many friends throughout the dental profession in Canada.

New Year's Greeting from the President of the Canadian Dental Association.

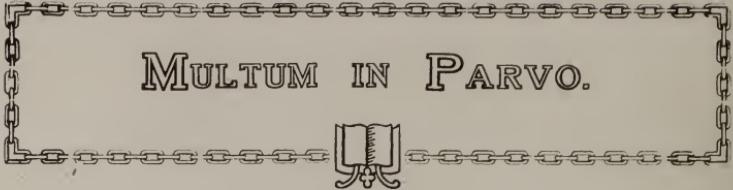
I TAKE this opportunity of extending to the dental practitioners of Canada my sincere wishes for a happy and prosperous New Year. At the close of 1914, may each one feel that he has made progress personally, and that he has done something to help in advancing his chosen profession toward the status it should properly occupy.

The New Year is always a time for making good resolutions, and it would be wise right now to firmly resolve to attend the meetings of the Canadian Dental Association in the City of Winnipeg, May 26, 27, 28 and 29, of this year.

Again wishing one and all a happy New Year, I am,

Your obedient servant,

GEO. F. BUSH,
President Canadian Dental Association.



MULTUM IN PARVO.



This Department is Edited by C. A. KENNEDY, D.D.S., 2 College St., Toronto
Librarian, Royal College of Dental Surgeons of Ontario

*Helpful Practical Suggestions for publication, sent in by members
of the Profession, will be greatly appreciated by this Department.*

To OBTAIN A PERFECT MODEL.—One method: Soak your impression in water; run up model while impression is very wet; let stand until plaster is well set, soak again and separate immediately. My method: I make up impression plaster with water deeply dyed with carmine; then, after impression is taken, I immediately take a wet pledge of cotton in pliers and rub gently over entire surface of impression; then I wait a few minutes until the process of setting is complete and immerse in water a couple of minutes, blow out the surplus water from impression, run up model by first painting impression with freshly prepared plaster and then pouring remainder; wait until plaster is thoroughly set and again immerse in water two or three minutes and separate while wet. I obtain better results than with any separating material.—*V. B. Newell, The Dental Review.*

COMPENSATING FOR THE EXPANSION IN PLASTER MODELS.—The inherent tendency of all varieties of plaster is to expand in setting. When confined by the sides of the impression and tray, warpage of the model results, the palatal portion of the latter rising to a slight extent. To obviate this difficulty, the impression is removed as soon as possible after the plaster constituting the model has set. This can usually be done in from ten to fifteen minutes after pouring the impression. Although this method obviates warpage, it does not control expansion, which goes on for twenty-four hours or more. The expansion is compensated for by scraping a shallow, rounded groove around the labial and buccal periphery and a sloping but definite groove across the disto-palatal portion of the model at the point where the distal margin of the denture will terminate. Models should be of sufficient thickness to withstand stress exerted in closing the packed flask, viz., they should be usually not less than 8 mm. thick in their thinnest part.—*J. H. Prothero, Dental Summary.*

ORAL HEALTH.

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Vol. 4

TORONTO, JANUARY, 1914.

NO. 1

EDITORIAL.

Dr. Kirk's Paper.

UNDoubtedly the most notable paper that has been presented to the dental profession of Canada is that by Dr. Edward C. Kirk, read at the last meeting of the Toronto Dental Society, and which appears in this issue.

No member of the profession who is a seeker after truth has escaped that feeling of impotence inseparable from a battle with an unseen foe. While it is true that the experiments of Miller turned the flank of the enemy, the fortunes of physical warfare have never been more uncertain than have the struggles for light on the question of susceptibility and immunity that have followed the acceptance of Miller's findings.

It is interesting to note that the essayist points out the fact that Miller himself realized that while his experiments cleared up many of the phenomena in connection with dental caries, the vital point of variability in susceptibility remained largely unsolved at the time of his death.

The doctrine that Dr. Kirk has set forth is so plausible that there may be danger of its too ready acceptance without that measure of experiment and research which the author

himself deems necessary before its final acceptance as truth.

Should the theory of a fermentable carbohydrate content in the saliva prove to be the explanation of susceptibility, it will emphasize, as it has never been emphasized before, the fact that a closer study by physician and dentist of the field of the other might have cleared up many obscurities for each and resulted in incalculable good to the general public.

Medical works have for years contained reference to increased susceptibility to caries in certain diseases. Whether or not the loss of tooth tissue referred to, in all these cases, is true caries remains to be investigated. Be that as it may, however, the fact remains that, except for the experiments of Dr. Kirk, little has been done in the way of investigating these variabilities in susceptibility to tooth destruction, and some the essayist himself has not as yet touched.

That the carbohydrate diet is, in many cases, followed by rapid and widespread decay has been proven to the satisfaction of every practitioner. Among the workers in candy and biscuit factories the teeth are destroyed with phenomenal rapidity. A sweetish odor to the breath can be detected in these individuals, although candy may not have been eaten for some time.

As the author states in concluding his paper, he has placed the problem of dental caries in such a position that it may be studied from a new angle. The new view of the subject presents such interesting possibilities that it is not at all improbable that the next scourge of humanity to be definitely placed in the preventable list shall be dental caries.

Canadian Dental Association.

CHE Canadian Dental Association is to Canadian dentistry what the Federal House is to Canadian citizenship. It is the national organization of the dental profession in this country, and has a noble work to do in organizing and unifying the dental interests of Canada and correcting possible tendency toward provincialism.

The vast area of Canada is responsible for a wide distribution of her people. Under such circumstances national organizations of every kind are to be encouraged. Every movement that brings together individuals from every section of Canada, for national discussion, whatever the subject, is worthy of the support of every good citizen.

National organization not only gives inspiration and mo-

mentum, but more important still, the clearer vision and wider view. The need for such organization is just as great in the case of dentistry as of any other branch of science or of any other department of activity.

Every dentist in Canada should make a special effort to attend the next meeting of the Canadian Dental Association to be held in Winnipeg next May. From the personal standpoint attendance at the convention may seem to indicate some measure of sacrifice, but in reality it will prove of inestimable value. The mere attendance at a national convention cannot fail to give one a new view point and an uplift that will be felt for many days.

And all this *plus* the great service *your* attendance will render to Canadian dentistry. It is surely *worth while*. The C. D. A. is not composed of a select few. It is for every dentist in good standing in Canada and every dentist should be present.

A Jury's View of Dental Fees.

A SPECIALIST in orthodontia recently brought suit against a patient, before Judge Morgan, in the City of Toronto, for services rendered, charging upon the basis of \$10.00 per hour.

The defendant in the case called two dentists as witnesses, and one of these stated, under oath, that his charges were \$5.00 per hour, and that he was not a specialist. Judge Morgan stated that a specialist was entitled to ask any fee he chose, but that there should be a clear understanding with the patient before the work was proceeded with. The solicitor for the defence, in his address to the jury, stated that in his own practice he felt satisfied to receive \$1.00 per hour, and that a lawyer could not collect more than \$2.00 per hour. This argument may have appealed to the jury, but sounds rather ridiculous to any man who has ever received an account for legal service "duly rendered."

After deliberation, the jury awarded the plaintiff an amount equivalent to \$5.00 per hour, and evidently looked upon this as a reasonable charge for regular dental services. The jury was no doubt influenced in their judgment by the statement of the judge that, while a specialist might charge \$10.00 per hour, a definite arrangement should be made with the patient as to the fee, which the evidence showed was not done in this particular case.

The Teeth of the Irish and Scotch Compared.

DR. STEWART, the Medical Officer for East Suffolk, who read a paper at the British Dental Association, declares that the best teeth in the United Kingdom are those of the Irish people, and the worst those of the Scotch people.

Dr. Stewart attributes the deterioration to the inordinate passion of Scotch children for sweets. Mr. Rhodes, the President of the Association, suggested as another cause the increasing habit of making meals of tea and bread and butter and the decreasing consumption of oatmeal. Another authority suggested that the deficiency of lime in Scottish water is a contributing factor.

The strong white teeth of the Irish are attributed to simple vegetarian diet. The Irish eat little meal and few sweets, and their food is of the kind that requires biting. Soft food makes soft teeth.

IT is interesting to note that the Canadian Dental Supply Houses are keeping pace with the general advancement of the dental profession.

The Temple-Pattison Company has recently built, at 243 College Street, Toronto, a five storey stone and brick building of most imposing structure, and are now occupying the entire ground floor (covering well over five thousand square feet) for their main depot, and the basement for stockrooms, shipping-room, etc.

The depot is well laid out, containing large tooth, sundry, and gold departments. Especially noticeable are three very handsome model operating-rooms, a reception room, and a model laboratory, containing all the newest designs in furniture and time-saving appliances. The building is conveniently situated almost opposite the Dental College.

Some time ago the S. S. White Company secured space in the new Foresters' Building, on College Street, and will, upon completion of the building, occupy quarters upon the second floor for their Toronto depot.

With the Temple-Pattison Company and the S. S. White Company, on College Street, and Ash & Sons' Depot, situated on Grenville Street, the "Dental Centre" of Toronto has now moved considerably up-town.

Taking Criticism.

"It is a healthy sign in a man when he does not bristle all over the minute someone begins to criticize him. It is generally an indication that he has learned a few things in the fruitful school of experience, one of them being that nearly every man deserves criticism once in a while, and another that undeserved criticism cannot possibly do any serious harm. If your self-appointed critic lays an undeserved censure upon you, don't fling back at him, at least not until you have thought the matter over. If he does nothing else for you at least he may stir you up a little and thus prove your friend. Some folks who are denied the blessing of criticism go to sleep at their tasks. Really a critic is usually a very good friend and most of us would do badly without him."



George F. Bush, D.D.S.

Winnipeg

President Canadian Dental Association

ORAL HEALTH.

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION"
AS WELL AS THE "POUND OF CURE."

VOL. 4.

TORONTO, FEBRUARY, 1914

No. 2

Professor Gysi's System of Anatomical Articulation.

(Continued from December Issue)

By W. E. CUMMER, L.D.S., D.D.S.

Professor Prosthetic Dentistry, Royal College of Dental Surgeons Toronto.



Dr. W. E. Cummer

MOUNTING IN ARTICULATOR.

THE trial plates are waxed together on the lingual side as a precautionary measure, and mounted in the condyle path measuring frame (which has been left undisturbed, with its pencils in an equidistant position from the face), and this in turn is mounted on the goose-neck and stand, and is slid into the articulator in position of mounting, keeping the pencils just opposite the condyle pins, and equidistant from them, as in Fig. 45.

Plaster is mixed and the models fastened to the bows of the articulator, and when set the next step follows, namely, setting the articulator to records.

The lateral and condyle paths may now be easily set on

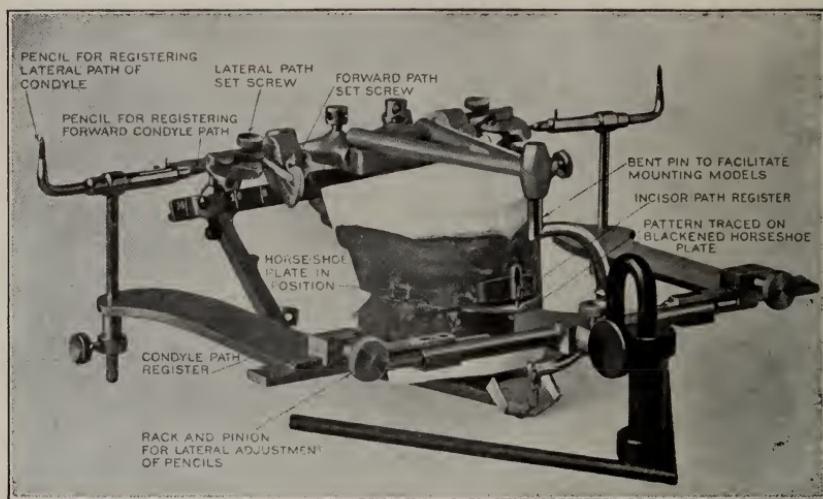


Fig. 45

Gysi Articulator Handbook

Showing various parts assembled, ready for mounting models in articulator.

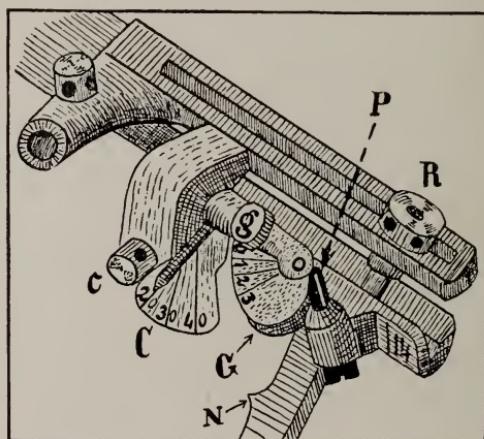


Fig. 46

Gysi

Dials on each side of articulator for lateral movement condyle path, and rotation point. P, steel pin corresponding to condyle. G, dial bearing condyle path under, along which the condyle pin moves in its path, and which may be rotated on its axis to correspond to lateral path registry obtained from patient (Fig. 38-37-42), and retained by set screw g, and guides the condyle path laterally according to the inclination set. C, pointer working on stationary dial, which may be set at condyle inclination, held by capstan screw c, and which rotates on short rod bearing the lateral path register with its condyle path surface underneath, above mentioned. R, represents the rotation point capstan screws, which allow the rotation points to be moved in and out.

the dials (Fig. 46) provided for that purpose on the articulator from the recorded movements, which leaves only the rotation points to be set. A piece of wood about one-eighth of an inch thick is placed between the trial plates to keep the tracer off the blackened wax (which would mar it), and side movements given to the lower model. The rotation points on the articulator are moved in and out until the tracer follows the pattern traced by the patient.

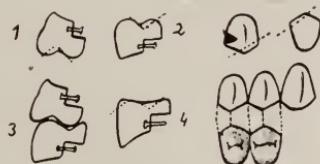


Fig. 47

Gysi Cosmos, 1910. Some alterations required on present forms of artificial teeth.

GRINDING TEETH.

The artificial teeth in use at the present time require a certain amount of grinding in order to accommodate them to the newer discoveries and measurements. Profesor Gysi, however, promises us new moulds, which will be ready in six months' time, which will require little or no grinding, having been designed with all these movements in mind. The central is beveled at an angle of 45° , the lateral 25° , and the cuspid about 10° , with the distal edges beveled off. The

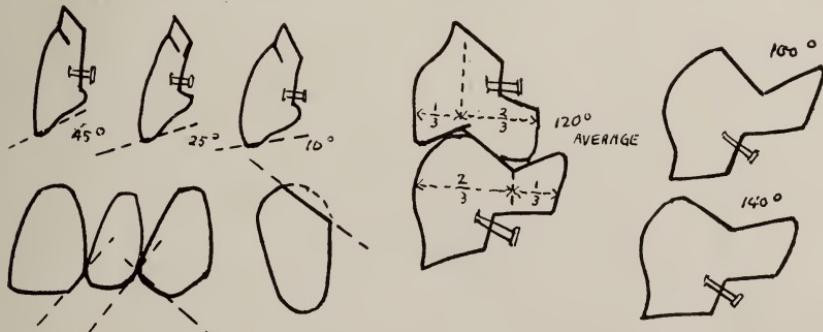


Fig. 48

Showing alterations in anterior six. Central beveled at 45° , lateral at 25° , cuspid at 10° . Facet made on disto-incisal angles of central and lateral. Mesial slope of upper cuspid and distal slope of lower is lengthened. Note position of cuspid summit and masticating groove in upper and lower molar in centre of cut, the groove of which is the average angle 120° . The right hand pair show grooves for extremes in lateral movement, 100° groove for 10° lateral movement and 140° groove for 33° lateral movement, and proportional variations in between.

mesial slope of the upper cupid is lengthened, as is the distal slope of the lower, allowing them to pass one another in the side movement. A sulus should be given the molars, if necessary, of from 100° to 140° , depending on the amount of the lateral movement, with 120° as the average. The lateral movement may be seen in Fig. 42, varying from 10° to 33° , with 16° or 17° as average. The amount of angle of masticating groove is determined by the lateral movement,

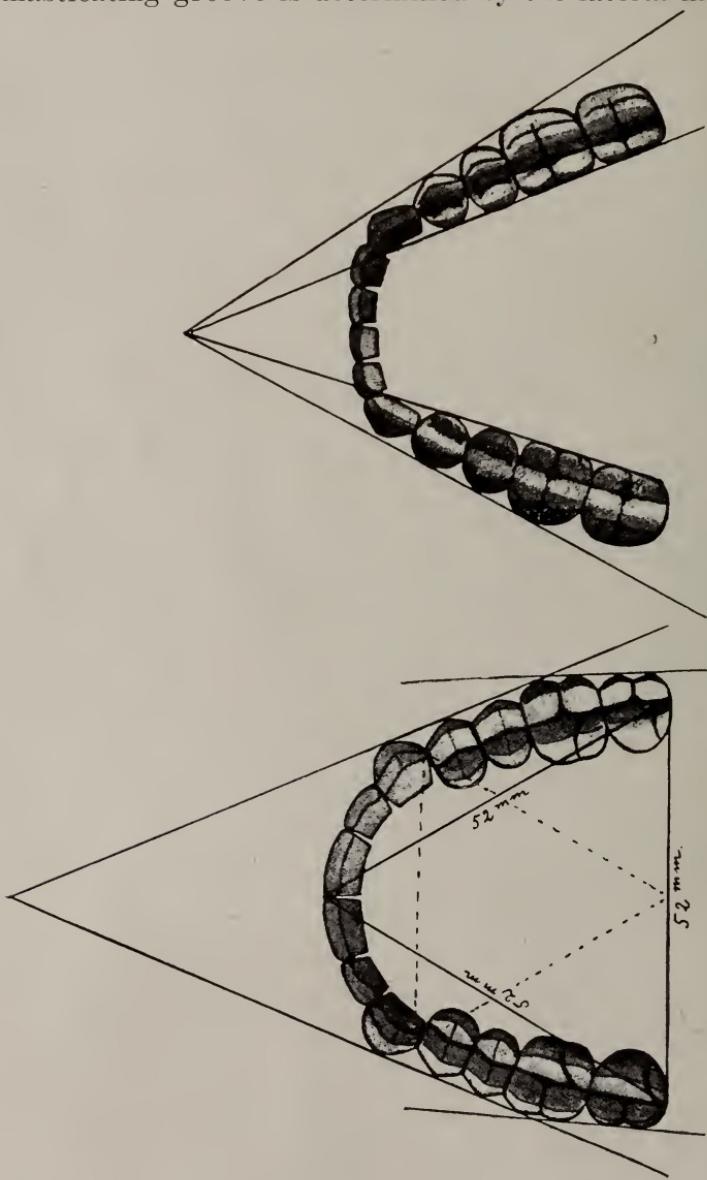


Fig. 49
Gypsi, Cosmos, 1910. Showing general arrangement of arch, subsequent to modifications governed by the facial characteristics of patient.

and is proportional to it, while the amount of "tooth curve" or curve of Spee, is determined by the inclination of the condyle path, and is proportional to it. Figs. 21AB, 22, 23, 23A, 24.

PLACING THE TEETH.

The general arrangement of the teeth may be seen at Fig. 49. The upper anterior six should be placed first, and the esthetic features of the case proved before further work is attempted. The bows of the articulator are then separated by raising the upper one on the vertical support (See Fig. 27A); then the bicuspids and molars are next placed with the difference of level of cusps shown on Fig. 50. The

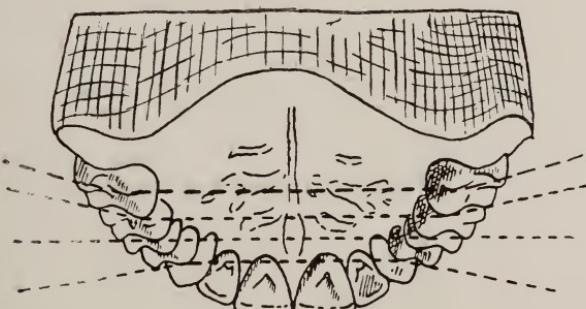


Fig. 50

Gysi, Cosmos, 1910. Showing difference of level in buccal and lingual cusps of molars and bicuspids. In first bicuspid lingual cusp slightly higher than buccal; in second bicuspid cusps same level, in first molar buccal cusps higher than lingual and second molar buccal cusps still higher than lingual. This arrangement with suitable compensating curve given them (Fig. 21 A and B) gives a very similar result to teeth placed on compensating curves carved in wax.

greater the inclination of the condyle path (0° — 45° , with 35° as average) the greater the degree of the inclination of the first and second molars from the occlusal plane, and greater difference of level between buccal and lingual cusps. (Fig. 50.) The cutting edges of the anterior six and 1st and 2nd bicuspid buccal cusps touch occlusal plane. (Fig. 51.) Curves may be carved in wax previous to setting teeth, but are considered by Dr. Gysi as unnecessary work. The upper teeth having been placed, the lower second bicuspids are placed and side movements made. In grinding for interference, care must be taken not to grind occluding but articulating surfaces, as shown in Fig. 52. The first lower molars are then placed; then the second lower molars; then

the first lower bicuspids, and lastly the lower anterior six, giving each the lateral and protrusive movement. This will result in an approximately correct articulation. This may be further corrected by warming the back eight teeth, upper

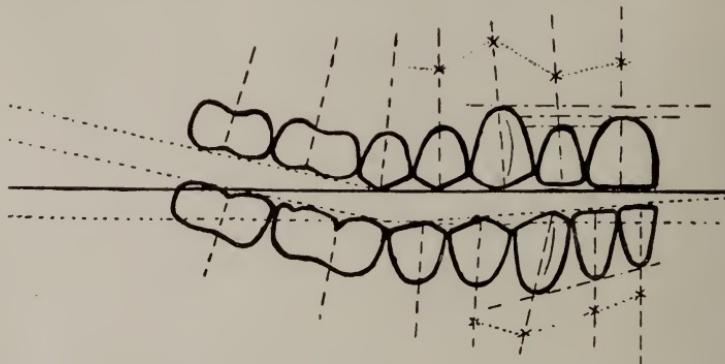
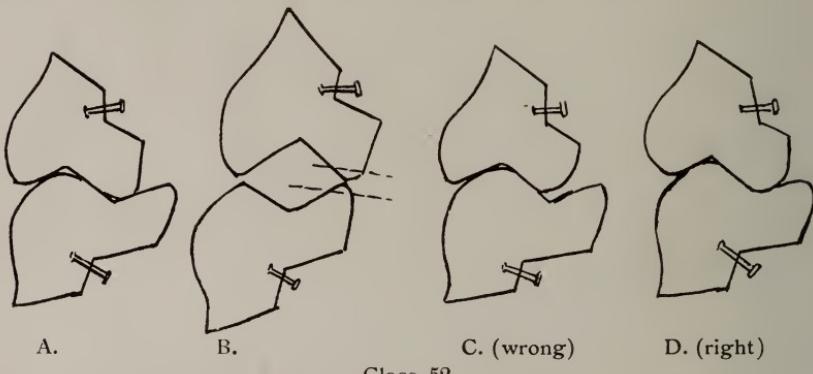


Fig. 51

Gysi Cosmos, 1910. Shows arrangement of upper anterior eight on occlusal plane, giving inclination to two lateral molars in proportion to condyle path. Similar arrangement to Curve of Spee. (This arrangement is subsequently modified slightly by heating and pressing together in masticating positions, as described in text.)



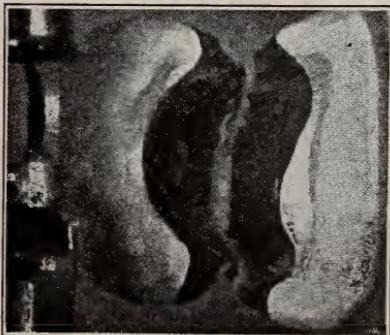
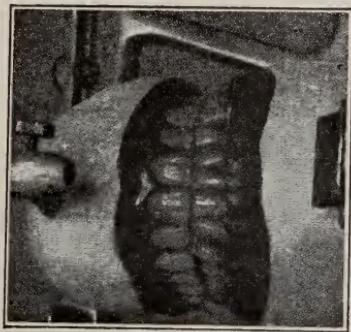
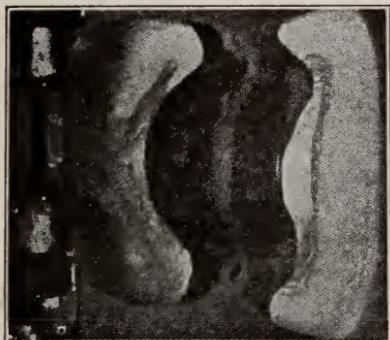
Class 52

A, shows upper and lower molar in position of occlusion; B, the same in side movement, with interference on lingual cusps, causing separation at buccal cusps; C, interference incorrectly relieved by grinding lingual cusp of upper which is lacking in filling the lower groove in occlusal or rest position; D, interference correctly relieved by grinding lower lingual cusp; no loss of contact in occlusal position.

Rule.—Do not grind the occluding surface where an articulating surface may be ground to correct interference.

and lower, end to end, and making pressure in the masticating movements. This will give them their correct position in the wax, and after this has been effected, the mechanical efficiency can now be greatly increased by raising

the anterior guide pin in the upper bow back to its original correct position in the upper bow, placing a mixture of carborundum powder (medium grit) and glycerine, about the consistency of molasses, between the teeth, and giving the movements of mastication. This process will remove the



Gysi, Cosmo, 1910. Showing masticating positions in properly constructed artificial dentures.

Class 53

last traces of interfering porcelain, and give a mechanically correct result. (Fig. 53.) The case at this stage may be tried in, and if the technic is correct it will work as well there as in the articulator.

In placing the teeth, care should be taken to place them as nearly as possible over the ridge. (Fig. 54.) If this is not

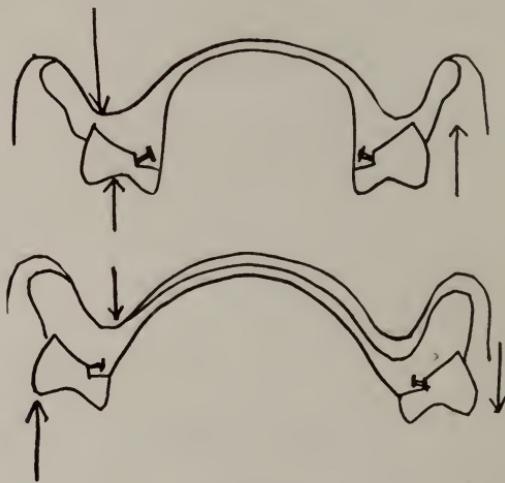


Fig. 54

Keeping teeth over ridge; upper drawing shows teeth over ridge. Upward stress tends to seat more firmly. Lower drawing indicates teeth outside ridge, stress tending to displace.

possible, the lowers should be placed outside the uppers. (Figs. 55, 56.) If this occurs on one side only, in many cases a better mechanical result is obtained by placing the upper teeth on the lowers, and if on both sides, the upper right on the lower left, and vice versa. A facet will have to be ground

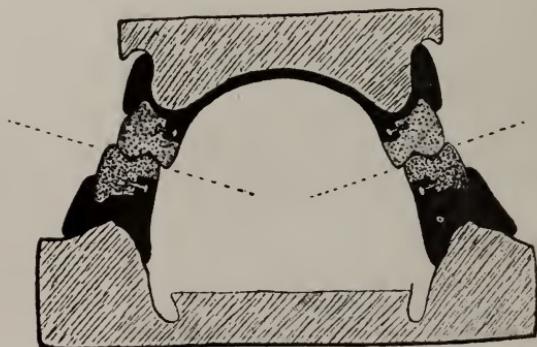


Fig. 55

Gypsi Cosmos, 1910. Correct position of teeth, narrow upper and wide lower.

on the mesio-buccal cusp of the molar, as in Fig. 57. In the case, such as Fig. 58, with a lower second molar, a strongly inclined lower ridge, it is better to leave off the upper and lower molars, in order to avoid dislodging stress anteriorly. lower second molars, in order to avoid dislodging stress anteriorly.

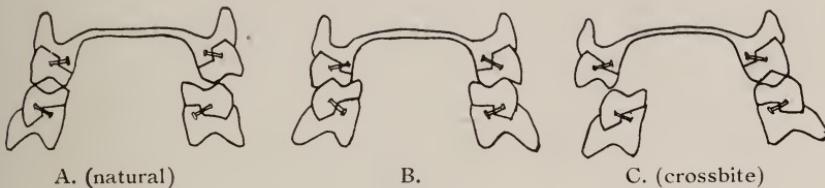


Fig. 56

Cuts showing action of natural bite and cross bite in side bite position: N, natural; C, lowers outside uppers or cross bite.

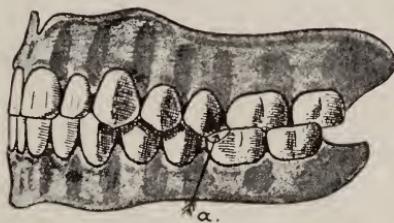


Fig. 57

Gysi Cosmos, 1910. Showing facet (a) ground in lower first molar, cross bite last two molars only. Allowing second bicuspid to pass in cross bite.

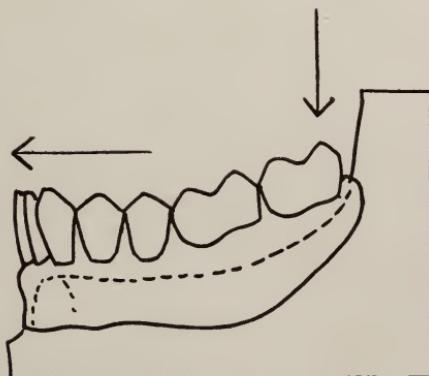


Fig. 58

Case with steep inclination at back of ridge. Downward force tends to push denture bodily forward. In such extreme cases best to leave second molars off.

VULCANIZING AND FINISHING.

It may be readily seen that the greatest care in flasking and vulcanizing is necessary in order to prevent movement of the carefully arranged and formed teeth. Non-use of set-hastening agents in the plaster, careful packing of rubber, gradual application of the power of the flask press, proving of the amount of rubber in the flask by linen, separating the halves and reopening, make up a few of the well-known precautions.

REMOUNTING AND CORRECTING IN ARTICULATOR AFTER VULCANIZATION.

If the double vulcanization method or metal bases have been used, the pieces may be returned to the articulator, carborundum powder and glycerine placed between them, and any interference caused by slight movement of the teeth during vulcanization may be removed. If vulcanite is used, and vulcanized in the ordinary way, any corrections may be made in the mouth, by folding carbon paper 1 in. x 3 in. on itself, making a double-faced strip $\frac{1}{2}$ in. x 3 in., and thus locating whatever interfering spots there may be present.

APPLICATION OF SYSTEM TO CASES NOT FULL UPPER AND LOWER.

Cases of restoration involving large losses in molar and bicuspid region, such as full upper restoration, with more or less natural lowers in position; cases with lower natural anterior six only standing; cases with upper and lower natural anterior six standing, or similar, in which the principles of anatomical articulation are quite as necessary and important as the full upper and lower restoration, may be conducted, utilizing the principles to the fullest extent. This requires slight modifications in two of the registering instruments—the horseshoe plates and the incisor tracing point Fig. 27, No. 9, with the natural upper teeth in; compound may be softened into the lingual side, pressed against these, removed chilled, and the tracer held against the teeth while the patient makes side movements, tracing the triangular pattern in the black wax. Also, if the natural teeth occur in such locations as to interfere with the pins on the lower side of the horseshoe plate, a new horseshoe plate may be readily made out of 22-gauge German silver, the two rods soldered on, omitting any or all of the pins, and by softening

and attaching compound on its lower side, chilling and returning to the lower teeth, the various records may be made with ease and certainty. In setting models in articulator, the lower model must be set first, the horseshoe plate removed, and the upper fastened to the articulator in contact with already-set lower, in position of occlusion.

*A Plan that Solves the Fundamental Problem in School Hygiene.**

BY ALFRED C. FONES, D.D.S., BRIDGEPORT, CONN.
Chairman of the Oral Hygiene Committee of the National Dental Association.

[This article was presented by Dr. Fones at the meeting of the International Congress on School Hygiene, recently held in the City of Buffalo, N.Y. It should command the careful consideration of the entire dental profession. We also publish in this issue copy of manuscript received a few days ago from Dr. Fones, outlining his work in the establishment and operation of a Training School for Dental Nurses. "Oral Health" will be glad to hear from members of the dental profession as to the advisability of legalizing the Dental Nurse in the Provinces of Canada. There are two sides to the question. Let us have your ideas.—Editor.]

COANALYZE the subject of hygiene for the uplift and betterment of the children in our public schools, we must first determine what are the main factors existing at present that act as a detriment to proper development and also as the chief causes of illness in child life.

The large number of papers presented at this congress, covering so many phases of the subject merely proves that we must reach a conclusion, first as to where we should concentrate our energy, and then one step at a time eliminate the most conspicuous evils that beset the school children of our country.

*Read before the Fourth International Congress on School Hygiene, August 26th, 1913, at Buffalo, N.Y.

If our large steel plants and rolling mills were obliged to reroll from fifteen to twenty-five per cent. of their stock, it would not take them very long to find out what was the matter. No business now-a-days could withstand such a high percentage of loss in doing its work over again.

In our public schools throughout the country it is a fair estimate to say that the percentage of children in the first five grades who are reviewing their grade, will range between fifteen and twenty-five per cent. In a majority of the cities the average would be nearer the latter figure. What is the matter? Is it our system of teaching, crowded schools, poorly lighted or ill ventilated buildings, or is the chief cause to be found in the material itself, the child?

Let us examine the average boy of ten years of age and see what we find. Face, ears and nose unclean, hair unkempt, hands grimy and dirty fingernails. Shoes splashed with dry or wet mud, clothes soiled, and an odor percolating through the atmosphere to excite suspicion that his little body has not been washed for some time. His eyesight may be good and yet it may be defective. If his face is washed it may disclose a color that is lacking in the bloom that a boy of ten should have, and we might say—anæmic.

If otherwise his body appears normal we ask him to open his mouth. If his external appearance troubles us, his internal appearance would shock us. Here we find teeth covered with green stain, temporary and permanent teeth badly decayed, possibly fistulas on the gum surface showing the outlet for pus from an abscessed tooth or teeth and decomposing food around and between the teeth. Why examine this child any further? Here at the gateway of the system is a source of infection and poison that would contaminate every mouthful of food taken into its body. With decomposition instead of digestion taking place in the alimentary tract, it is no wonder that the child suffers from an auto-intoxication which produces eyestrain, anæmia, maliase, constipation, headaches, fevers and many other ailments.

Such a mouth is an ideal breeding ground for germ life, and a child with such a mouth is far more susceptible to infectious diseases than those whose teeth are sound and kept free from food debris. Suppose at the entrance of our cities such a rank condition existed. How long would it be before disease and sickness would be swept in among the inhabitants? This boy described is but duplicated in the girl of ten. Decayed teeth constitute the most prevalent disease

known. It is difficult to find two children out of one hundred with perfectly sound sets of teeth. In a thorough dental examination of five hundred and fifty school children in the town of Stratford, Connecticut, but one child was found to have a set of teeth free from decay.

Look over the reports of the medical inspectors in the public schools who have made but a glancing examination and you will find that decayed teeth outrank all other physical defects combined.

Therefore we must deduce from our analysis for school hygiene that the most conspicuous defect of the child is the unsanitary condition of its mouth. Like a pig pen or garbage drain slowly seeping its poison into the brook, which flowing into the reservoir contaminates the water supply of a city, so do the products of abscesses and decayed teeth with decomposing food slowly but surely poison the human system. Such mouths breed disease. Such children laugh and sneeze millions of germs made virulent and active in an ideal feeding ground. And then again the teeth as a crushing and masticating machine are frequently ruined by the time the child has reached twelve or fourteen years of age. It is true that they can limp through life with this dreadful handicap, the same as an automobile can climb a steep hill on three cylinders, but you can rest assured that the child with wrecked mouth at fourteen is travelling on his second speed until he reaches thirty-five and from there he drops into his low gear to finish the journey in a slow and uncertain state. It is true that many have lived to a ripe age with unclean mouths and wrecked teeth, not on account of such conditions, but in spite of them.

If it be conceded that the most unhygienic feature of child life is its mouth we then come to the problem—how can we establish clean mouths, sound teeth and the tooth brush habit? To try and fill the teeth of the children in our public schools is a noble charity, but an endless chain. Like an immense flood decayed teeth have spread over the civilized world to such an extent that hardly one-tenth of the population of a country such as ours could find a sufficient number of dentists to fill their teeth. I believe it to be a conservative estimate to say that the children found in the first five grades in our public schools would average not less than six good sized cavities in their teeth. If you will but figure out how many children there are in your city in the first five grades, you can roughly estimate the immense amount of work there would be for a corps of dentists to cope with

such a task as filling their teeth. This would not mean merely plugging a hole in a piece of ivory, it means the painstaking work of a dental operation on live tissue as well as the tedious and slow work of treating and saving teeth which have dead pulps and possibly abscessed roots.

But let us assume that it is possible to fill these teeth and save them for the time being, how are we to prevent a reoccurrence of decay as well as to check the flood with the children coming into the schools in the primary grades each year? Surely every dentist knows that the tooth brush alone will not stop it, and every dentist also knows as well as the parents how difficult it is to induce children to properly brush their teeth and take care of their mouths as they should. Would it not be better to evolve a system for the prevention of dental decay and the establishment of clean mouths than try to cope with the hopeless task of filling the thousands of decayed teeth? I am heartily in sympathy with the scheme that every city should have a dental clinic for the school children for the relief of pain, and I believe it is inhuman in this twentieth century to allow the poorer class of children to suffer as they do from toothache. But let us draw a line on the conditions as they exist to-day, and I would present this plan, partly suggested by Dr. Ottolengui of New York, for your consideration.

It is a clinical fact that fully eighty per cent. of dental decay can be prevented if monthly or even bimonthly surface polishing of the teeth with orange wood sticks and fine pumice can be systematically followed. These treatments of course to be augmented by the faithful and correct use of the tooth brush, floss silk and lime water as a mouth wash.

Suppose it were possible to start a year from this September and place in our schools trained women who would confine their efforts the first year to the children in the first grade. These women to be trained and educated as hygienists who would be competent to give each child a surface treatment of the teeth once a month. Each woman to have the supervision, to start with, of two hundred children. These children in the first grade to be taught the proper use of the tooth brush, mouths inspected daily for cleanliness and no child permitted to enter the class room who had not brushed his teeth. Hands and face to be clean and hair combed. Bodily cleanliness also insisted upon and efforts made to secure the co-operation of the parents. Several teachers in the primary grades have told me that even on the coldest days in winter it is impossible to close the

windows for five minutes on account of the odor from the children's bodies. Such a condition of affairs should not be permitted and is unnecessary in a country where water is so plentiful. Talks in the class room as well as the use of the stereoptican in the assembly room would greatly aid in securing the desired results. These nurses could also be of great aid to the medical inspectors. At the end of the year they would follow the children into the second grade and a new corps of nurses would enter the first grade with the new pupils. This is to be repeated for five years until the first corps of women were caring for their class in the fifth grade. It is doubtful if it would be necessary to carry this work beyond the fifth grade as the child would be cared for through the most susceptible period for dental decay.

Now what would such a system mean to the children. It would mean that from the first day that the child entered school it would be taught cleanliness. That when the first permanent tooth entered the mouth it would be under the supervision of the nurse who would teach the child how to keep it clean and who would also aid with the monthly polishing. It would mean that during the first five years of school life habits of cleanliness would be established that would mold these boys and girls into new types of men and women. Fully three-quarters of the diseases incident to child life would be eliminated. With an additional knowledge of food values and how to properly masticate their food instead of bolting it, the main factors for hygiene would be covered.

Booker Washington once said: "If I can teach a colored man the gospel of the tooth brush I feel that I can make a man of him." Those of you who see but little of children can hardly realize what an uplift and different point of view there comes with a clean mouth and polished teeth. It is interesting to see a child whose teeth have been polished and a washbowl instruction given in the use of the tooth brush, gradually change in general appearance regarding cleanliness. I have known them in a few weeks to choose a new set of companions because the old friends no longer looked attractive to them. No one ever saw a rowdy with a clean mouth, for cleanliness breeds refinement. The proper food supply to the body and cleanliness are the two main foundation pillars for health, and these must be taught and practiced before we can hope to obtain satisfying results in the betterment of child life.

There is much in life worth while besides teeth, but I know of no one factor that is more conducive to health than sound teeth and a clean mouth.

The question may be asked: How are we going to educate these women to be hygienists and dental nurses? In every large city there are men in both the medical and dental professions who are competent to establish a lecture course for this purpose. The necessary training in the prophylactic treatment of the teeth would of course be given by dentists. Both of these professions are anxious to aid in any cause so worthy, and I believe they would willingly give their time and knowledge to start such a movement.

It is impossible in this paper to give the details concerning the education of these women and their full duties in the schools, but enough has been stated to permit those in charge of our public school system to consider the proposition in a general way and determine if this plan is a solution of the main problem regarding school hygiene.

Training School for Dental Nurses.

BY ALFRED C. FONES, D.D.S., CHAIRMAN OF THE ORAL HYGIENE COMMITTEE OF THE NATIONAL DENTAL ASSOCIATION.

No method that has been advocated up to the present time, can wholly solve the problem of Mouth Hygiene, but that which seems to more nearly approach a practical solution of the many difficulties involved in the education and adoption of the woman assistant, who can devote her entire time to this work. In this way not only can the public be reached through the dental offices, but these prophylactic workers can enter our public schools and besides treating the children have opportunity to educate them, and so hold out some hope of eventually coping with this great problem.

For even were the dental profession educated and thoroughly aroused to the importance of mouth hygiene, they would be powerless to care for one-tenth of the people who so sorely need this form of treatment and instruction. Knowing from a practical standpoint, what women can do for health conditions by these prophylactic treatments and

instruction in mouth hygiene, I have felt warranted in starting a campaign for the prevention of disease by taking a class of thirty-two women and, with the assistance of a corps of lecturers, educating them to be Dental Hygienists.

The main object in undertaking this work was not, and is not to form a school for the education of these women, but, primarily, to secure a text book whereby educational bodies and institutions could permanently form a school for this movement. It was most gratifying that, when the subject was presented to the various lecturers whose names appear in the schedule, that they immediately appreciated its possible beneficial results in the prevention of disease, and were willing to come to our aid and give time and knowledge gratis, to help solve the problem.

The lectures of these men are being given in the class room, taken down verbatim in shorthand, typewritten, sent back to the lecturer for revision and condensation, again typewritten and made ready for publication. Up to the present time nothing has been compiled that may be utilized for such a text book, and it is our hope that this book will form a basis for placing this educational movement on a practical foundation.

In the process of the formation of this text book, the opportunity seemed exceptional to start a nucleus of workers, and so a class of thirty-two women was organized to receive the theoretical instruction. In addition to this I have volunteered to give them a six weeks' practical course, training them in work and instruction in using the instruments and polishers on manikins, on children and on adults.

These women are not being trained as chair assistants, but are being taught the various causes of disease, emanating from mouth infection and lack of knowledge of general hygiene. It must be clearly understood also, that they are not being taught to treat disease. Their work is purely on the plus side of the health line, and nothing in the course, either theoretical or practical, is advanced for them to follow in treating diseased conditions of any kind. In order to have them have an appreciation of the science of prevention, it is essential for them to have some knowledge of the diseases attendant upon unsanitary mouths, and it is with these ideas uppermost in the minds of the lecturers, that their various subjects are being presented.

The first quarter of the course has been completed, and I feel that the dental profession have in store for them a

great treat. No dentist, however well informed, can help but be wonderfully benefitted by reading the lectures of these men, nor can he fail, after reading them, to appreciate the important position which he occupies as a dental surgeon in being a teacher of, as well as a powerful factor for the prevention of disease.

It may also be readily understood how helpful such a book will be in adding to the knowledge and training of the medical nurse in her work in hospitals and sanitariums. The awful mouth conditions that prevail among most of the patients in these institutions are serious handicaps in preventing cures and recoveries that might otherwise be obtained were it not for the constant infections taking place from unsanitary mouths. It is one of the problems to-day in the hospitals that the medical nurse, if educated and trained as a dental hygienist, can do much to solve.

Following is the list of lecturers and their subjects. The lectures vary in number, the essentials of the various subjects being presented in the fewest possible lectures.

ANATOMY.—

Raymond C. Osburn, Ph.D., Professor in Barnard College, Columbia University.

PHYSIOLOGY.—

Alexander M. Prince, M.D., Instructor in Medicine and Physiology, Medical Department of Yale University.

BACTERIOLOGY AND STERLIZATION.—

L. F. Rettger, Ph.D., Assistant Professor of Bacteriology, Sheffield Scientific School of Yale University.

ANATOMY AND HYSTOLOGY OF THE TEETH AND JAWS.

NOMA CLATURE.—

R. H. W. Strang, M.D., D.D.S., Bridgeport, Ct., Specialist in Orthodontia.

INFLAMMATION.—

Leroy S. M. Miner, M.D., Assistant Professor, Harvard Dental School.

THE SKIN IN HEALTH AND DISEASE. . Also Brief outline of symptoms and Diagnosis of Chicken Pox, Small Pox, Measles, Scarlet Fever, etc.—

Dr. George M. MacKee, Instructor in Dermatology, College of Physicians and Surgeons, New York City.

(a) ORAL SECRETIONS. (b) DEPOSITS AND ACCRETIONS ON THE TEETH. (c) THE PSYCHOLOGY OF HANDLING CHILDREN.

Edward C. Kirk, Sc.D., D.D.S., Dean of Dental Department of University of Pennsylvania.

DENTAL CARIES.—

Eugene H. Smith, D.M.D., Dean of Dental Department of Harvard University.

ALVEOLAR ABSCESS AND ODONTALGIA.—

M. L. Rhein, M.D., D.D.S., New York City.

PYORRHEA ALVEOLARIS.—

R. G. Hutchinson, Jr., D.D.S., New York City, Specialist in Treatment of Pyorrhea Alveolaris.

MALOCCLUSION.—

R. Ottolengui, M.D.S., New York City, Editor of *Items and Interest*.

THE TEETH AS A MASTICATING MACHINE.—

Chas. M. Turner, M.D., D.D.S., Professor of Mechanical Dentistry and Metallurgy, School of Dentistry, University of Pennsylvania.

THE CHEMISTRY OF FOOD AND NUTRITION.—

Russell H. Chittenden, Ph.D., LL.D., Sc.D., Director of Sheffield Scientific School of Yale University.

SURGICAL OPERATIONS THAT MIGHT HAVE BEEN PREVENTED BY THE DENTAL HYGIENIST.—

M. J. Schamberg, M.D., D.D.S., New York City, Specialist in Oral Surgery.

HYGIENIC ASPECT OF DENTAL OPERATIONS.—

Herman E. S. Chayes, D.D.S., New York City.

FACTORS IN PERSONAL HYGIENE.—

C. Ward Crampton, M.D., Hygienist and Director of Physical Training, Public School System, New York City.

POSTURE AND FRESH AIR.—

Professor Irving Fisher, of Yale University, Chairman of Committee of One Hundred on National Hygiene.

LENGTHENING THE LIFE OF THE RESISTIVE FORCES OF THE BODY.—

Dr. William C. Anderson, Professor and Director of Yale University Gymnasium.

THE TEACHING OF MOUTH HYGIENE TO SCHOOL CHILDREN.—

Thaddeus P. Hyatt, D.D.S., New York City.

DENTAL PROPYLAXIS.—

Alfred C. Fones, D.D.S., Bridgeport, Ct.

The Ideal Filling.*

BY CLYDE DAVIS, M.D., D.D.S.,
Dean Lincoln Dental College, Nebraska.

CHE Dental Profession has been for many years, and will probably be for many years to come, in quest of the ideal filling. A filling with the chief virtues of all of our best materials and minus the faults so common to all now in use.

When we look back upon the dawn of our profession, we wonder how it managed to save any teeth at all with the small array of materials at hand. Under what discouragements it must have labored and how unsatisfactory must have been the results?

There has been wonderful advancement since those days. Now we have different filling material for nearly every cavity presented, and we are so far from the *one* Ideal filling that it takes an extra cabinet about the office to store a sample package of each of the materials we should have at hand. Every little while a new one comes to the front and perchance it may be the ideal one sought. Like the drowning man who grasps at the straw, we seize it with delight and place it beneath us with a little bundle of similar straws, only to find that it assists but little to keep our heads above the swirling current that threatens defeat in our effort to save the organs of mastication.

The profession is divided into three classes. The Ultra-Progressives, The "Wait a Whiles" and the "Billy Goats." The progressives jump in where "Angels fear to tread," and do a world of injury to their patient's mouths and a mint of damage to their practice with the advent of each new method of material. The "Wait a Whiles" stand aloof until the experimenting has been done, and then come in to reap the reward, financial and otherwise, made possible through a chance to view the wreckage left in the wake of the passing storm.

*Read before the Toronto Dental Society, Saturday evening, 31st January, 1914.

[Dr. Amy's discussion of this paper will be published in our next issue and will embrace a general discussion of the subject of Silicates.—*Editor.*]

The "Billy Goats" are content to stand without and cry: "Laboratory Experiment." "I have saved teeth nigh onto these forty years with soft gold, tin and amalgam, and I guess I can do it a while yet." Hurrah for the "Billy Goats." They will live long and die happy.

It is fortunate for the confiding public that the profession is made up largely of the "Wait a Whiles," as through them it is reaping the benefits of the few experimenters, who are forcing upon our consideration the various advancements which makes our daily practice look like a kaleidoscope. At nearly every visit of the patient we have some new filling or method to offer them for the same old kind of cavity that troubled our fore-fathers. In many instances if you do not have something new to offer, the patient seems surprised, and it looks at times as though they were getting to be with their teeth the same as with their dress, demanding an innovation every time they visit an emporium. The past few months or years have brought to us many materials and methods to supply the demand for the Ideal Filling.

Of this Ideal Filling much is demanded. It must defy detection when in place. It must never change in shape, consistency or bulk after being placed. It must be suited to every location in the mouth. It must be a non-conductor of thermal changes. It must require a minimum loss of sound tooth structure for its introduction. It must require a minimum loss of time on the part of the patient, and it seems that the profession demands that it requires little of the dentists time as well. In case this last requirement is met, in the Ideal Filling when it arrives, it is a question if it will not do the profession an injury as time and skill are all we have to sell, and they must go hand in hand to augment the gross receipts from the public.

Materially shortening the time of our operations should legitimately decrease the gross income of the profession, and it might be well to eliminate this feature in our quest for the Ideal Filling.

Fortunately for all concerned the materials and methods more recently brought forward have taxed our skill to the limit, and in some instances, increased the time required of the dentist and decreased that of the patient.

As each candidate for the Ideal Filling has appeared we have measured it by the requirements. In every instance it has been declared short of the Ideal in one or more specifi-

cations. The specification which has eliminated from the ideal race more than all others is the one, "Suited to every location in the mouth." Because of this we are forced to declare the field yet unoccupied, and keep with us a large assortment of materials, out of which to select the "Ideal Filling" for each individual case.

We are all liable to become overly enthusiastic in the first flush of our success with a new material, and attempt its application to all cases, only to find the truth of, "A place for everything and everything in its place."

We call to mind an instance which will illustrate this. Some years ago when the fused porcelain inlay nearly electrocuted the dental profession, an ultra progressive had just completed a beautiful angle restoration at a western state meeting. A "Wait a While" timidly asked the clinician, "In what cavities do you advise the use of the fused porcelain inlay?" The Clinician replied, "Wherever a tooth decays." The "Wait a While" caught his breath and ducked. That same clinician has returned to the metal fillings for posterior cavities subjected to the stress of mastication.

The porcelain inlay has found its place and is the Ideal Filling then in its place.

The cast gold inlay or rather the method of making the gold inlay was the next cyclone which threatened to tear us from our moorings. The storm broke upon us with warning. The progressives stormed the fore castle and climbed the rigging. The "Wait a Whiles" peered from the port holes, while the "Billy Goats" went to the hold with the stokers from which place they have not yet ventured.

Teeth were literally cut to pieces in an effort to inlay everything and some dentists tried to forget all the dentistry they had previously known.

But like the porcelain inlay it is settling down to its place as the "Ideal Filling" in the ideal place, and the "Wait a Whiles" are happy. The "Billy Goats" are still in the hold and the progressives are upon the promenade deck flirting with the Misses Silicate, of which Miss Synthetic Porcelain seems to be the favorite. The oldest of this family seems to have lost cast. Her color was not right. Every time she came out her complexion became bad. But Miss Synthetic seems to stand the color test and is the favorite to-day. She has some younger sisters, but they are as yet not of marriageable age, and we are waiting developments.

This brings us to the consideration of the latest fad, the Silicate filling. What is said here is particularly about Synthetic porcelain, as with this we have had our most flattering results. With this new material we have so far progressed as to find that like the others, it is the "Ideal Filling" in the ideal place. That it has many virtues, yet faults which eliminate it from the position as the one ideal for all cases.

This material will not stand inter-proximal wear. When correct marble contact has been made it requires only a few months or years at most, to so flatten this contact as to make it decidedly faulty and a diseased gum septa results when used in the proximals of molars and bicuspids.

The silicates are all more or less soluble in the fluids of the mouth, and particularly the lactic acid of tooth decay. For this reason the fillings are proving a menace to the proximal surface of the proximating tooth. The roughened surface provides a habitat for the acid forming bacteria, and within a few months a previously perfect surface opposite a well made silicate filling will show the tell-tale etching.

These fillings have a poor edge strength as compared with gold, and demand an obtuse angle at their margin, to get which we must have an acute cavo-surface angle in all localities subject to stress, a porcelain which is entirely out of the question in many locations, due to the direction of the enamel rods. They will not stand on the occlusal surfaces of molars and bicuspids unless the opposing teeth are missing.

The Silicate filling will not stand when its margin crosses the incisal edge of any of the twelve anterior teeth. With these statements before you, you are no doubt beginning to ask, "Well, then, what are they good for?" They are indicated in a great many places where they are the most satisfactory filling we have to-day. They are fairly permanent in some locations, many of them are invisible and being a plastic can be placed with a minimum loss of tooth substance. They please the patients, for as one said, "I would rather be temporarily natural than permanently disfigured."

Then where should we use them? First: In small cavities as these seem to be of greater permanence than the large ones in the same locations. This is true of all fillings, and the silicate is no exception.

Second: In those proximal cavities in the anterior teeth not involving the angle, particularly where both surfaces

of that space are decayed, and where the access is for some reason difficult for the introduction of cohesive gold.

Third: In gingival cavities in anterior locations, because of esthetic reasons.

Fourth: The plastering up of wrecks in anterior locations to put off the inevitable porcelain crown.

Fifth: The facing of large angle gold inlay restoration in anterior teeth, which can be so made as to protect the incisal cavo-surface angle with the inlay.

When the use of synthetic porcelain is restricted to the fore-going places it will prove quite the "Ideal Filling" in the "Ideal place," and has quite a range of usefulness.

The cavity preparation as to outline, resistance, retention and convenience forms, as well as the removal of decay, finishing of enamel walls and toilet of the cavity is not unlike that considered ideal for amalgam, except that the beveling of the enamel margins should be omitted. This constitutes a weak feature in the procedure as the last enamel rod at the cavo-surface angle, when unsupported has little resistance to stress, but even this is stronger than the margin of the sylicate which has been rendered acute by the beveling of the enamel margin.

The selection of the shade for use must be attended to before the rubber dam has been placed. A common error is to select a shade which is too light or too blue. It is the dentine largely which is being replaced by the filling, and these are shades 3-4 and 5. Take these as a base and modify them by adding the lighter shades or blues.

The directions which are sent out with the material are far from correct. They do pretty well for laboratory experimentation and demonstrating purposes, but utterly fail in practice, and are at present the cause of the failures reported.

The material should be mixed much thicker than that shown by the paid demonstrators. As thick as it is possible to produce a gloss to the mass by patting it with the spatula. So thick that if the entire mass was shoved from the slab to fall to the floor it would not stick or materially change shape.

The mixing process is as follows:—To the fluid add about one-half the total powder required and spatulate by a circular motion, describing the arc of a very small circle, say with a radius of one-fourth of an inch. Then add the remainder of the powder, a small portion at a time, using

the crowding method of incorporation. First from one side then the other till the mixture loses its gloss. Immediately pat the mass with the clean shank of the spatula. It is correct if the gloss returns to the mass after three or four blows, and does not stick to the spatula. If correct, immediately crowd the cavity to overflowing, and again pat the mass in the cavity till the surface glosses, using this means of shaping the contour.

This patting the mass on the slab, and in the cavity is a very essential feature of the process. It is the only means of making the mass homogeneous, an essential to every desired virtue. Before the setting process begins we are dealing with physical conditions, like unto fine sand and water, a mixture of which can only be made homogeneous by puddling through, paddling or jarring. We were taught this in filling the matrix for the fused porcelain inlay.

As soon as the filling has been rendered glossy by paddling or malleting, it should be coated with something to exclude the air. Cocoa butter is the most popular. The filling should not be touched with anything till primary setting has taken place. This is in from four to six minutes if the foregoing method has been used. At this time external trimming may be begun. Here the makers are again in error. They say "avoid steel instruments." The writer uses keen edged enamel chisels, plug finishing knives and files, such as are used to finish a gold filling, but used exclusively for the synthetic porcelain. We have never had one discolor, and the edges do not crumble under the treatment. However, the gross trimming must be done before the final setting has taken place, or it cannot be done with the instruments, as they will slip from the surface of the filling as they would from glass and the finishing will all have to be done with carborundum wheels, strips and disks, a much slower process. These should come in after, for the final finish, all of which should be done at the first sitting and with the filling at all times flooded with cocoa butter.

The finishing complete, the cocoa butter should be wiped off and the filling coated with a sticky wax that will remain on for from 24 to 48 hours.

White paraffin so commonly used is entirely unsatisfactorily. A good copal ether varnish is better, as it can be applied without using a heated instrument.

Synthetic porcelain so manipulated, and under a restricted range of position is proving a delight to both patient and dentist, and is giving years of usefulness, as an Ideal Filling.

Relation of Dentistry to the Evolution of Public Health.

BY MARK G. McELHINNEY, D.D.S., OTTAWA.

FOR many generations since the inception of what we call civilization, mankind has held the idea that nature was inexhaustible, and all that he needed to do was to take and use without reference to a possible future lessening of means of life.

During the last century it came to the knowledge of the students of human affairs that with the increase of the world's population, some resources, at least, were showing signs of diminishing, and that an unthinking prodigal expenditure would ultimately result in a scarcity of certain of the means of existence.

Then was born the idea of the Conservation of natural resources, a curtailment of prodigal waste and a system, or systems of conservation which would ensure to coming generations many means of supply which otherwise would become exhausted.

In Agriculture, in Forestry, in Wild Life and in many other departments this conservation idea has been developed and sustained until every civilized country has now its Department of Conservation looking and working toward the maintenance of the supply of the means of human existence.

In Canada, our Conservation Commission, under the leadership of a chairman of exceptional ability and singleness of purpose, the Conservation of natural resources is becoming a matter of National moment and of magnificent accomplishment.

Now comes a step in advance when the Medical and Dental professions recognize a truth that in the earlier history of human civilization was grossly overlooked, and that is that it is of small avail to conserve material natural resources if the central fact of civilization, man himself, be not conserved and rendered capable of enjoying and using the resources at hand.

The gospel of a sound citizenship, physically and mentally able to grapple with the battle of life, fit to combat the

rapidly increasing competition and win out, is becoming evident as the first requirement of national stability and greatness. In the Evolution of Public Health alone, comes the solution of this great problem, and to us as citizens of a great and growing country comes the duty of working out the means by which this great work can be efficiently accomplished.

The profession of Medicine, despite the difficulties and prejudices against which it has been compelled to labor, has done signal service for mankind. In sanitation, in hygiene, in antiseptic surgery and in the higher development of aseptic surgery, it has reduced the menace of disease to a very small proportion of what existed but a few decades ago, and by such means, not only has human life been vastly conserved, but the span of life for the single individual has been materially increased. Infant mortality has been vastly reduced and the range of those great plagues which formerly and periodically depleted the race has been reduced to a minimum and in the most advanced countries made impossible.

Now comes the era of preventive medicine of prophylaxis, and in this era the newer, younger and untried profession of Dentistry or Oral Surgery can play a large and important part.

It is one of those strange occurrences in the history of human development that the professions of Medicine and Dentistry, both looking toward a common end, should have become separated and developed apart. Each with its own system of education, its own army of investigation, and its new line of professional development.

Now in the field of preventive medicine, where the mouth and teeth play as large a part as do any of the other organs of the human body, it is becoming evident that the two professions must join forces, and the time is not far distant when the old line of demarcation must be lost in the necessary accomplishment of one object, the conservation of public health. One of the most gratifying and promising signs of this community of objects is shown when the best exponents of the gospel of public health comes to discuss the subject at a recognized meeting of the dental profession.

We may take this sign as an epoch marker in the history of our profession in Ontario, and a proof that the labors of our societies and of our oral hygiene committees have not been without fruit.

Certainly, we do not desire to presume to encroach upon the domain of general medicine, but we do believe that we can be of service in the work and can bring the specific knowledge which we possess of dental and oral conditions to the assistance of the older profession in carrying out the magnificent work in which it is engaged.

The mouth is the gateway of the body, it is the greatest natural culture area of the germs of disease. Every diseased condition is reflected therein, and it bears the stamp of heredity to perhaps a greater degree than is shown in any other organ or group of organs and as such may be looked upon as the barometer of the racial health.

This is why we have made such strenuous efforts toward the inspection of the teeth and mouths of children and to have the bad conditions of these organs rectified.

In the conservation of human life the child is the greatest asset. The future of the nation depends upon the value which it places upon the child. The health, happiness and education of the child should be the first consideration of a civilized community. In the development of the race there are two conflicting forces, normal evolution and degeneration. The future depends upon the preponderance of the conserving forces over the disintegrating forces, and our treatment of the child is the deciding element. Our duty is to defeat the influences of degeneration, and we can accomplish this only by studying the conditions and endeavoring to remove all influences that tend toward it.

Doctor Nodine, of New York, in a recent paper on "Efficient Dentistry and Industrial Efficiency," writes as follows: "Efficient dentistry makes for industrial efficiency. Teeth ought to be conserved and oral righteousness taught for the following reasons: to insure and protect the health of the workers; to better and increase the product and service; to satisfy the wants and safety of the consumer or patron; to secure the prosperity and stability of the employer and for the elimination of inefficiency and the development and utilization of potential human power." Industrial efficiency if the marriage of brains to physical force. The result is the production of tangible, saleable things called products, goods, output or service. Upon the health of the progenitors depends the quantity and quality of the progeny."

This statement of the economic value of oral hygiene is thoroughly supported by the facts and figures obtained during the past few years by the most painstaking methods.

The question of oral hygiene is fast becoming one of paramount public importance and rightly because the vast and labored resources of modern medicine and surgery beat blindly on the empty air if the oral cavity be left in a state of neglect.

There are three ways by which the germs of disease may gain access to the human body: the mouth, the nose, and by infection through break in the integument or in a mucus membrane other than nasal or oral.

The normal breathing passages from nose to lungs are protected by an ingenious process of air-warming and air-filterings, a process which renders infection very difficult.

The integument and mucous membranes are normally whole and to a great extent self-protecting, the integument by desquamation and the mucous membrane by excretion, hence infection is not easy.

The mouth is the open doorway, free to all and sundry, with no protection beyond a possibly unbroken lining and the knowledge of its owner. Into it is thrown, three times daily, a heterogenous mass of extremely perishable goods, alive with bacteria and loaded with ferments, to be ground, sorted, digested and distributed throughout the various departments of the human organization.

The whole subsequent results depend upon the excellence or otherwise of the service rendered by the staff in the receiving office of the organization. If the work be well done, the body may well defy disease; if it be ill-done, no device of medicine or surgery can long delay the inception of disease.

Dr. James C. Colton, of Providence, R.I., coined the phrase, "A child's health can be only as good as its teeth." The phrase is as universally applicable to the adult.

Doctor McCullough, with the skill of a master, has told us of the evolution of public health, of the heroic labors of the pioneers in the science of medicine, of the magnificent history of human endeavor and human attainment in the alleviation of this department of human ills, disease the direst, most distressing and causative of most others.

Blind and ungrateful would we be to underestimate the worldwise results of these noble efforts or seek to detract from the credit due those who have accomplished so much.

In the near future, however, we see a new era dawning, an era in which the inexact arts of the repentics shall give way to the more newly exact science of prevention. The era of drugs, pills and plasters is waning. The drug store

of a decade ago has become an ice cream parlor, a lunch counter and a market for smallwares and mostly useless trifles. The prescription counter is relegated to a dark corner of small dimensions. Intelligent people are asking today, not "How shall we be cured?" but "Why should we be ill at all?" The modern physician is teaching the people how to live and the science of public health is his coming domain.

The old schools of medicine were based upon curative methods alone, and in the defence and exploitation of these many valuable years have been wasted. The disciples of the old schools have in the past been too pedantic, too egotistic and too impatient of criticism. Progress has been sacrificed to ethics, and the innovator has been too often laughed out of court. Medicine as well as religion has had many fetishes.

The public health activities of the present day are happy evidences of new dispensation, a time of intelligent toleration and a recognition of the great truth that all that is true is not necessarily included in any one system, however authoritative that system may appear to be.

There is but one danger in the modern movement in medicine, and that is the violation of the right of each individual to the possession of his own body. While we have no doubt the right to teach, to advise and to regulate regarding all matters of public health, I do most emphatically object as unjust any attempt at the administration or performance of any medical or surgical service to or on any individual without his consent excepting perhaps in the case of an irresponsible person without anyone with authority to speak for him.

Suspected Rabies.

IN cases of suspected rabies the biting animal should not be immediately killed unless it be particularly ferocious.

The animal is usually docile and can be tied up or confined. If the dog has bitten because of rabies the disease is well advanced, and the animal usually dies within a few days.

If at the end of ten days the animal is still well there is not one chance in ten thousand that the dog had rabies, and the patient's mind is set at rest. If upon the other hand the animal dies the short delay has not been hurtful to the patient.—*Ontario Board of Health Report.*

The Use of the X-Ray in Dentistry.

By F. M. WELLS, D.D.S., MONTREAL.

CHERE has appeared recently, in dental literature, a number of articles showing the young man how, from a business standpoint, he can commercialize dentistry. Articles of this character have no wturned to the use of the X-ray as a method of increasing dental practice.

In the interests of the dentist, as well as his patient, it is necessary to bear in mind that the use of the X-ray is frequently accompanied by many serious results, particularly when operated by those having but a limited knowledge of the subject.

All penetrating forms of radiation (as X-rays and radium rays), in which the lesions are correspondingly deep-seated, should be handled only by those familiar with their danger.

High-frequency radiation (violet, ultra-violet, X-ray) should therefore be used only under the direction of experts fully familiar with their physiological action and dangers.

It is true that the later X ray machines are very rapid in their action, and require a very short exposure, especially so since Dr. Finsen introduced phototherapy and radiotherapy, but they are yet a very dangerous invention in the hands of a novice. Even the best X-ray experts are doing harm that is only discovered six to twelve months after the real damage has been done.

There is greater destructive action of radiation on micro-organisms than on the cells of the human body, extending not merely to the pathogenic bacilli, but to all organisms living in the dark. Thus the spermatozoa, which biologically are independent living organisms, seem to be killed by X-rays before any damage is done to the body, and permanent sterility then results. Among the cells of the body, differences seem to exist in their resistivity.

We all have to admit that frequently the X-ray picture enables us to give much better advice to our patients, but, in view of the fact that our knowledge of the action of ultra-violet frequencies is most meagre (not only of the rhythmic flow of the oscillating light corpuscles of that

region, but of that single, solitary, infrequent impulse similar to the ultra-violet, the X-ray), it requires little effort to believe that there is a region beyond the ultra-violet, as it is now known and used, capable of the most intense and violent and physiological action, similar to any destructive agent applied to the tissues and causing a reaction. It is this reaction of the ray that is turned to therapeutic usefulness, and if the X-ray is properly applied in suitable cases, a helpful reaction of the tissue is caused.

Therefore the successful use of the X-ray depends upon the fact that X-ray primarily is a destructive agent.

In regard to the X-ray in the dental profession, from a business standpoint, I am reminded of my old friend, Dr. A. W. Thornton, who said in his article, *The Great Need*, which appeared in the *Dominion Dental Journal* of March, 1913: "If the profession of dentistry is not to be thoroughly and absolutely commercialized, the most stupendous efforts must be put forth to combat the present-day tendencies."

What is required in the dental profession is a few men of Dr. Thornton's ability, who will pay more serious attention to general pathology and bacteriology, in which case it would be a very short time before we would have a class of dentists who would be followers of Dr. Hunter in his statements concerning the variety and gravity of sepsis caused by fixed bridges, gold caps, etc., etc.

Our Letter from Buffalo.

BY HABEC.

A REAL DENTAL CONVENTION.

CHE Northeastern Dental Association held three days' meeting at Hartford, Conn., about the middle of last October, and by invitation of the Programme Committee, Habec traveled east to participate in its deliberations. The territory of the N.D.A. comprises the six New England States, and is, in consequence, next in importance to our National Association. Dentally speaking, the east is right up to the minute, and in many ways they may be considered leaders. The president of the Association is Dr. F. T. Murless, of Hartford, whom Habec considers one of the rarest advocates of our great profession. A man of unusual attainments, cultured and scholarly, Dr. Murless

stands as a notable example of the ideal professional man. Contact with him always carries with it a sense of personal benefit and acts as a dental, mental and moral stimulus. That's the sort of duck he is, and his short "President's Address" was just like himself, a gem of concrete thought expressed as too few in our profession might do it. Just to get "in bad" with the compositor, Habec feels impelled to swipe a few gems from his address for you. For example, as John D. Wells would say, the following: "It is seventy-five years since the first dental college was founded in Baltimore. Keenly disappointing as must have been the refusal of the faculty of that medical college at Baltimore to establish a chair of dentistry as a part of its curriculum, Hayden and Harris could not have failed in later years to see their grandest dreams dwarfed by the developments which followed the establishment of their dental school. It was, indeed, a small beginning, but Hayden and Harris were finely prophetic in their belief that dentistry had become a science and in their recognition of the possibilities of systematic instruction on it. In their keenest enthusiasm they little knew what this child of their dreams was to become.

"That there was much to learn must have been glaringly apparent to those foresighted men, for they were men of culture and of scientific bent, but they could not have known how great a thing they nurtured.

"It would have been impossible to persuade these men that an art which, to them, meant but relief from suffering, and the repair of the mechanical damage to the human machine incident to the loss of teeth, was to become a science in which that for which they labored, complete as it afterward became, should be overshadowed by a far greater thing—preventive dentistry, which is now rendering less necessary and constructively less important the thing for which they and the men who came after them so devotedly strove. Yet that last could scarcely have grown to its present recognition but for these beginnings and the fosterings of the thousands who followed Hayden and Harris.

"Practice ever outruns theory. On the enthusiasm of a broadening outlook, facts were many times cemented together with assailable theories, and in the crucible of debate on the floors of dental societies and in dental journals fond and cherished theories were forever destroyed, and facts snatched from firm associations were painstakingly and repeatedly readjusted to comply with each newly

discovered principle. These conditions and associations have ever given us strong men and forceful ones, and their enthusiasms and genius stand to-day crystalized as a part of the wondrous whole which we call dentistry.

"To you here there is no need of enlarging upon the breath and scope of dentistry to-day, or to enlarge upon the minute and technical skill demanded by its thousand processes, the choice and sequence of which are determined by intrinsic acquaintance with the growth and development of the human body, and with the disturbances to which it is subject. Preventive dentistry is more than this: it is super-dentistry, demanding the finest of skill and the highest knowledge, applied with a new purpose of a new hopefulness for the protecting and perfecting of the human animal.

"What prophylaxis will do we know. Its efficiency has been proven, and the public are beginning to clearly grasp its possibilities. That there is need of preventive dentistry is shown by the appalling school and dispensary statistics, and the demand for dental attention is world-wide and knows no geographical or social lines. To-day the economic value of the dental dispensary is recognized, and the true value of the science or oral sanitation as a department of the work for child welfare is becoming known, and educators and social economists are demanding that dentistry shall assume its just burden as a force in sociological progress.

THE PROFESSION.

"The profession of dentistry has achieved a personality and it is making a demand which cannot be ignored. There is before us a compelling situation which we must satisfy. Our educational standards must be materially raised. The responsibilities of a dentist have become such that what might be termed an average education is entirely inadequate as preliminary to a course in dentistry. The lack of definite habits of application and positive mental training will, in these later years, prove an insuperable handicap to students who would be creditably successful if they could be dated back twenty-five years and compelled to grow up with the profession. There is no professional or vocational work which demands a higher type of men than does dentistry to-day. Nowhere is there a greater promise of reward and recognition for high personal attainment. College graduation as a preliminary to graduation in dentistry is reasonable and needful. Nothing short of actual High School graduation should be accepted. A definite

attitude toward this matter on the part of the dental societies will give to the dental schools and dental boards a backing which they cannot but welcome, and through the higher educational standards thus established we will also secure a large increase in the quantity of student material, for which there is great demand."

Primarily, Habec's trip to Hartford was to discuss a ten-storeyed paper, with a roof-garden, by Dr. Clarence J. Grieves, of Baltimore, running under the six-cylinder title of "The Responsibility of the Dentist in Systemic Diseases Arising from Dento-alveolar Abscess, as Illustrated by the Etiology of Peridental Abscess." Now, will you be good. It serves you right for being a dentist. Well, it was a case of "go to it" for Habec, so he rolled up his sleeves, expectorated on his hands and jumped in. That's just the word —jumped in. The wise guy would have merely stuck his fingers in to see if the temperature was all right; but not so with Habec. He went in all over, and, of course, floundered around like a cockroach in the mullagatawny. After going down the second time, efforts were made to rescue Habec, which proved a failure because they attempted to grab him where the hair should have been; but he finally floundered out, somewhat "sadder Bud-weiser." But Clarence really gave us an excellent dissertation, which was greatly appreciated. Watch the *Cosmos* for it. Dr. Grieves has been doing a good deal of research work at Johns Hopkins, and has established some new theories. One of the main themes of the paper was a plea for a broader pathology for the dental profession. Our pathology should be local only when circumscribed, but its manifestations are always general; hence, we must adapt our knowledge accordingly. Incipient abscesses are more insidious than pus-forming ones, because the poison is absorbed and carried into the blood stream; whereas, fistulous abscesses discharge the pus through the opening. At any rate, he proved all the premises, and positively established the dentist's responsibility in this what you-may-call-it title, and everybody was unanimous. But after he had teed up for the nineteenth hole and squared off for a long drive, somebody told him there was no putting green, and no such thing as the nineteenth hole; so he put the caddie in his bag, finessed to his partner and cut for a new deal. That's enough isch-ga-bibble for this time.

HABEC.

Ontario Dental Convention.

CHE 24th Annual Meeting of the Ontario Dental Society will be held in the R. C. D. S. Building, on February 16th, 17th and 18th, 1914. This promises to be the best meeting ever held by the Society. The Program Committee has been most fortunate in securing very able men from the United States to give papers on subjects of keen interest to every dentist.

Dr. Hillyer, of Brooklyn, N. Y., will give a paper on "Some of the difficulties in Prosthetic Dentistry."

Dr. Voelker, of Brooklyn, N. Y., will give a very complete paper on "Silicate Cement."

Dr. Montgomery, of Buffalo, N. Y., will present a paper on "The Impression or Indirect Method of Working Cast Metallic Inlays."

These papers will be followed by Clinics by the Essayists.

Dr. F. Crosby Bush, of New York, who is so well known to the dental profession through his articles in the *Dental Digest* under the *non de plume* of "Brother Bill," will present a paper upon the subject of "The Basis of Fees."

The Manufacturers' Club, of the United States, will be in Toronto in full force during the week of the meeting with the best exhibition of dental goods ever seen in Canada, and their clinics will, alone, be worth a visit to Toronto.

The Ontario Motor Show is also being held during the week of February 16th to 21st.

Usual railway rates on the Standard Certificate Plan will be available from February 12th to 21st, inclusive.

The clinics this year promise to be more varied and better than ever before. Dr. W. B. V. Amy is Chairman of the Clinic Committee.

E. I. ZINKAN,
GEORGE W. GRIEVE,
Committee on Publicity.

Canadian Dental Association Convention.

CHE program of the Canadian Dental Association Convention this year extends over four days, instead of three, thus preventing the over-crowding of papers and discussions, and leaving more time for the social side of the convention.

This latter department is in the hands of a very active committee, and there is no doubt that those who journey to Winnipeg in May will not only have a *profitable* time, but a *good* time.

Dental Manufacturers' Exhibit.

IN connection with the Dental Manufacturers Exhibit, to be held in the Temple-Pattison Building, 243 College Street, Toronto, 18th, 19th and 20th February, 1914, an informal evening programme has been arranged as follows:—

Wednesday 18th, 8 p.m.—A Talk on Anatomical Articulation. W. E. Cummer, D.D.S.

Thursday 19th, 8 p.m.—Suggestions on the Cause and Treatment of Pyorrhea Alveolaxis. W. F. Spies, D.D.S.

Movement to Standardize Dental Colleges.

CHE Dental Educational Council of America, (composed of Representatives of the National Association of Dental Faculties, the N. A. of D. Examiners and the National Dental Association), is undertaking an inspection of all the Dental Colleges of the United States and Canada, with a view to grading the colleges according to standards. It is proposed to have three classes:—

Class A.—Colleges marked above 70.

Class B.—Colleges marked between 50 and 70.

Class C.—Colleges marked below 50.

The inspections will be held during January and February, 1914, and will cover the following points:—

Source of Control of Finances, Ownership, Control of Standards of entrance and course of study and their enforcement, Method of appointments to Faculty and Staff, Methods of granting advanced standing, Length of course, Required attendance at lectures and clinics, General character of curriculum, System of college records, Building and equipment, Laboratory and Infirmary, Faculties and instruction.

The investigations will be an effort to obtain from every possible source all the facts regarding dental education in the several colleges. Class A. colleges will have to show evidence of modern methods in all departments and evidence that the equipment and facilities are being intelligently used in the training of dental students.

A Radical Departure.

CHE L. D. Caulk Company has adopted the policy of presenting the claims of Silicate to the public, through the monthly magazines. The following copy appeared in the January number of the *Ladies' Home Journal*:

Esthetic Dentistry

Nothing is more beautiful than human teeth, as Nature made them. When they become diseased and broken down they must be restored, as a matter of hygiene and health. A skilled dentist is imperative.

Esthetic repair requires that they be restored to their original appearance, since dental science is now able to meet that demand.

When a woman of refinement goes to her dentist, she doesn't want to return with a mouth filled with evidences of dental work—when gold is required it must be unobtrusive; when not required, its display is a blemish.

A woman of taste wants her teeth when restored to look like teeth. They must have normal health and normal appearance.

Until recent years dentistry of this character was impossible, and those who visited the dentist had to be contented with the best that could be done. But now it is possible and is being done every day and all persons have a right to demand it.

There are millions of teeth of people in America, England and Continental Europe that have been so restored that the fillings cannot be detected. You may have often admired the beautiful teeth of a friend, which in fact contain numerous fillings which are so natural that they are not observed.

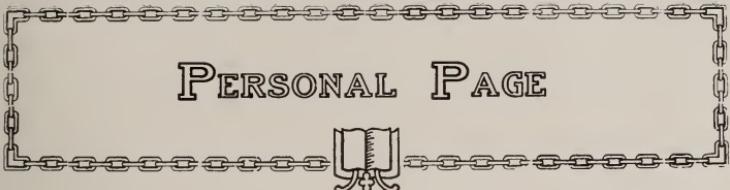
This is modern dentistry, good art, good taste, practiced by the skilled and advanced members of the profession on both sides of the Atlantic.

The material they employ is de TREY'S SYNTHETIC PORCELAIN. Remember the name and mention it to your dentist when next you visit his office. If it is indicated, he will almost certainly be glad to use it.

Its character is such that dental operations are shortened and made with less annoyance to the patient.

THE L. D. CAULK COMPANY
Philadelphia, Pa.

Laboratories, Milford, Delaware.



PERSONAL PAGE



DR. W. R. CAVANAGH has returned from the West and has re-opened an office in the city of Owen Sound.

ORAL HEALTH regrets to report that Dr. C. H. Lount, of Walkerton, Ont., died early in January, after a very brief illness.

Dr. E. H. Wickware, of Smith's Falls, has been a member of the school board for over seven years and was again returned at the head of the poll in the recent elections. You can't keep a good man down!

Dr. Jas. McIntyre, of Ottawa, was married on Christmas Day to Miss Violet Vance, of Toronto. ORAL HEALTH extends to Dr. and Mrs. McIntyre the best of good wishes, *ad lib*

Dr. Eaman, R. C. D. S., '12, is opening an office in Ottawa.

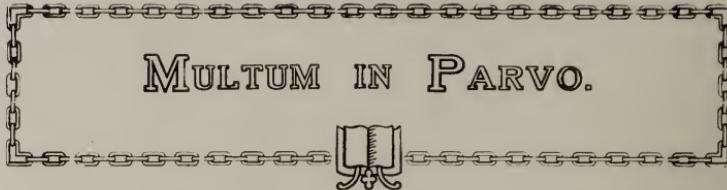
Dr. and Mrs. W. D. Cowan, of Regina, were at home to their friends on Friday, January 9th, it being the occasion of the twenty-fifth anniversary of their wedding and the debut of Miss Cowan.

Dr. J. B. Carmichael passed through Toronto early in January on his way back to Edmonton, after spending a very pleasant holiday in New York and other eastern points.

Vancouver and Victoria dentists are showing their practical interest in oral hygiene by organizing an educational campaign among their patients. Keep up the good work!

Dr. R. O. Howie, and Dr. R. M. Large, of Vancouver, are spending a winter holiday in California.

Nineteen candidates tried the British Columbia Dental Board Examination in November. The five successful candidates are Drs. Guy, Thompson, Carter, Grenius and Turner.



MULTUM IN PARVO.



This Department is Edited by C. A. KENNEDY, D.D.S., 2 College St., Toronto
Librarian, Royal College of Dental Surgeons of Ontario

*Helpful Practical Suggestions for publication, sent in by members
of the Profession, will be greatly appreciated by this Department.*

ADHESIVE PASTE.—Gum tragacanth one-fourth ounce, gum arabic one ounce, water four ounces. Heat the water and dissolve the gums in it, and strain while the liquid is hot.

GUM CAMPHOR FOR ADAPTING INLAY MATRICES.—Gum camphor, packed into the partly adapted inlay matrix, serves to swage the metal to a close adaptation, and when burned out leaves no residue.—*C. H. Neill, Dental Digest.*

CLEANING FILES.—Clogged files can be cleaned with ether, with benzine, or with spirits of turpentine and a stiff brush.—*Journ. Dentaire Belge.*

SOLDERING.—It is best to flux the backings of the invested facings and then place what you think is sufficient fluxed solder upon the backings before heating up the invested facings, as this lessens the danger of cracking the facings.

AID IN TAKING AN IMPRESSION FOR A BRIDGE.—Cases often present in which difficulty is encountered in taking an impression for a bridge. If milk of magnesia is painted over the parts to be reproduced, the impression may be taken out without any discomfort to the patient or trouble to the operator.—*L. Kohn, Odontologist.*

WATER FOR ARKANSAS STONE.—Water used on the Arkansas stone when sharpening instruments is just as efficient as oil and more cleanly.—*Dental Brief.*

PREVENTING THE STICKING OF MODELING COMPOUND.—In order to prevent the sticking of softened modeling compound to the fingers of the operator and burning them, the hands should be thinly coated with vaseline oil. By applying a thin coat of the same oil to the surface of the compound its adhering to the teeth or mucous membrane is avoided.—*Journal Odontologique, Per Cosmos.*

PREVENTING SOLDER FROM FLOWING.—Any portions of a crown or bridge, to which it is undesirable that solder should flow are coated with ordinary ink, after heating the piece. The borax is subsequently applied and the solder will be confined to the desired areas.—*Journal Odontologique, per Cosmos.*

DESENSITIZING HYPERSENSITIVE DENTINE.—If, in excavating a cavity, hypersensitive dentine prevents further progress of the operation, a solution of equal parts of zinc chloride, tincture of iodine and distilled water is applied on a pellet of cotton to the cavity for two or three minutes. If necessary, the application is to be repeated.—*Cosmos.*

A TRIAL BITE.—The bite taken with modelling compound in an upper and lower bite-tray will be very efficient, though not final, for it is not wholly dependable, and requires the trial wax plates for assurance of accuracy. Place the tray in patient's mouth, instruct to close just enough to retain it; then with one hand on the back of the neck and the other on the forehead, tilt the head backward until the muscles of the throat are tense; then require the closing slowly to the point of proper proximity of upper and lower, and mark the mesial and bite line. This method rarely fails to give the correct bite, and you will find its accuracy is more certain, and the simplicity of manipulation is much ahead of other means and devices you may have tried.

THE HARDNESS OF WATER AND DENTITION.—Hard water, that is to say, water holding a quantity of salts in solution, and in particular salts of lime, is usually considered bad for health. According to the observation of a German specialist, Dr. Rose, the beauty of the dentition should be in direct ratio to the hardness of the drinking water. The following table gives a percentage of dentitions, perfectly healthy, observed in thousands of children living in different localities where the water presented very different degrees of hardness.

Hardness of Water.	Proportion of Healthy Dentition.
Less than 2 degrees.....	1.3 per cent.
Less than 5 to 10 degrees.....	4.3 per cent.
Less than 15 to 20 degrees.....	6.4 per cent.

ORAL HEALTH.

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Vol. 4

TORONTO, FEBRUARY, 1914.

NO. 2

EDITORIAL.

George F. Bush, D.D.S., Winnipeg

DR. BUSH, whose photograph appears in this issue, is President of the Canadian Dental Association and Representative of Manitoba on the Dominion Dental Council. Well known throughout Canada and United States generally, Dr. Bush's activity has made him particularly well known in his own province, where he occupied the position of Secretary of the Manitoba Dental Association for many years, and later was elected President of the M. D. A., which position he has filled acceptably for the past seven years.

Dr. Bush has many interests outside dentistry, he being well known as an amateur student of art and music. He gives gratis, his services as organist and choirmaster to St. Michael's (Anglican) Church, Winnipeg. In 1913 he was appointed judge of art and handicraft for the Dominion Fair.

Under the Presidency of Dr. Bush, supported by a number of exceptionally strong committees, the convention of the Canadian Dental Association in May is sure to be an unqualified success.

The Passing of "The Dental Brief."

AFTER issuing *The Dental Brief* for seventeen years, the L. D. Chaulk Co., have discontinued publication. The passing of a dental journal of the type of *The Brief*, which for years maintained such a high standard among progressive publications, is an event of some significance to the dental profession.

The Brief was one of the type of dental journals maintained by a manufacturer of dental supplies and the publishers, in the editorial column of the last issue, point out some interesting facts in connection with this publication.

"We are proud of the fact that during its career we have "never permitted its reading pages to be commercialized. "No dental journal, no matter under whose auspices it may "have been published, could have maintained a higher stand- "ard than this journal. We have probably gone further "than any other journal in refusing to permit the mention "directly or by implication of any proprietary article in its "reading pages. Our advertisements have appeared in the "advertising pages and nowhere else.

"But any professional journal is of necessity a medium "of limited circulation, and our requirements as manufac- "turers call for publicity that shall reach all of the dentists "of this continent and other parts of the world.

"It is for this reason that we decided to establish the "*Dental Manufacturers' Quarterly*, a journal that is frankly "an advertising medium and that can be sent to dentists "everywhere and not limited by second-class postal privi- "leges."

The Editor of *The Dental Digest*, in commenting upon the discontinuance of publication, states that he does so, "because the dental profession is entitled to know the origin of some of the benefits for which it expresses little appreciation."

It is a matter of fact that with rare exceptions, the progressive journals are published by manufacturers of dental supplies.

While the manufacturer is undoubtedly interested in creating a valuable advertising medium, it is equally true that in issuing a publication of the high professional tone of *The Brief*, the manufacturer has placed the profession in his debt.

The subscription price of any dental journal does not begin to cover the actual cost of paper, and printing. For a mere trifle the profession obtains in the pages of its different publications what, without them, could never be obtained by the individual, even with the greatest expenditure of time and money.

As a profession we do not give to our professional publications the support they deserve. In many cases members of the profession take no dental journal. In many others the copies of those taken, receive a cursory glance, are perhaps laid aside for reference and finally lost. Few men recognize the fact that subscriptions to a number of the best journals, the systematic saving of the monthly copies, the yearly binding of them, places in one's library the best and most valuable contributions to dental science.

The suspension of publication of a number of the professional journals would be a calamity. It is not without the bounds of possibility that the action of the L. D. Caulk Co. might at some future time be followed by other manufacturers publishing highly ethical journals. Every member of the profession owes it to himself and to his patients, that he have at hand the best and latest thought of the profession. By no other means can he do this quite as well as by subscribing widely to the best dental publications and preserving and binding his copies. In addition the appreciation thus expressed by the profession, would undoubtedly compensate, as the subscription price never can, for the immense amount of thought, labor and expense incidental to the publication of even the most unpretentious of our professional publications.

The Shading of Silicate Fillings.

CHE common practice in placing silicate fillings is to pick a shade which most nearly corresponds to the shade of the tooth, or, if the shades supplied do not suit the case, to blend two or more of the powders till the desired shade is obtained.

The weakness of this method of shading is that a solid shade is obtained. In many proximal cavities it is found for instance, that the shade at the neck of the tooth is yellow, while that at the incisal edge is blue. To place a filling of

either of these shades produces a poor match at the cervical or incisal, depending upon which shade has been used.

It is a well known fact that, in baking a porcelain inlay for such a case, the different shades of porcelain are laid on in such a way that a solid color is not the result, but a blending of colors from the bluish tint at the incisal to the yellow at the cervical.

This same artistic result may be obtained in the silicate, if, instead of mixing the powders, two separate mixes are made, the operator making one and his assistant the other. The yellow mix is placed in the cavity first, filling it full at the cervical where the yellow shade is desired, but only partially filling it at the incisal. The bluish shade is then placed over the yellow at the incisal, giving in the completed filling a blending of shades, corresponding to those of the tooth.

In a labial cavity, in a tooth somewhat uneven in color, or stained in spots, a silicate filling of a solid shade cannot be placed without being somewhat conspicuous. If two mixes are made in this case, one of the foundation shade of the tooth and the other of the shade of the discoloration, a most artistic result may be obtained. Place the foundation shade in the cavity and then mix in, here and there, small pieces of the other mix. The finished filling will have an uneven color corresponding to that of the tooth.

Vancouver's School Dental Clinic.

VANCOUVER is the first city in Canada to follow the lead of Toronto, and appoint a salaried Dental Surgeon to begin the care of the teeth of school children. Dr. R. Carmichael Bamford has been appointed as School Dentist, by the School Board, and will devote five hours per week to the treatment of the teeth of needy school children recommended by the school nurses.

A thorough modern equipment is being installed in the School Board Building, and the members of the School Board are satisfied that the improved health and efficiency of the school children treated, will prove the wisdom of the undertaking in Vancouver, as it has elsewhere.

The Vancouver School Board is to be highly commended for this forward step in the interests of the children under their care. They may also consider themselves fortunate in obtaining the services of Dr. Bamford, a gentleman eminent-

ly qualified, both personally and professionally, to bring nothing but credit to this new departure in the care of the school children of Vancouver.

The Regina Public School Board has placed a dental clinic in one of the schools of that city.

The Kingston Public School Board are considering the question of School Dental Clinics.

NEXT!

A Post Graduate Course in Prosthetic Dentistry.

A POST Graduate Course in Prosthetic Dentistry embracing the latest developments in: Impression Taking, Anatomical Articulation, Partial Dentures and Removable Bridgework, including Roach, Gilmore and other special attachments, will be given under the direction of Dr. W. E. Cummer at a date to be announced later.

The course will be held in Toronto, and will last an entire week, three sessions each day, morning, afternoon and evening. Those wishing to take the course should communicate at once with Dr. Cummer at 2 Bloor Street East, Toronto, as only a limited number will be accepted.

DURING the month of October two hundred and seventy-nine children received complete dental treatment at the School and Municipal Dental Clinics in Toronto.

CHE Legislature is being asked to pass a bill placing all medical inspection of schools under the local Medical Officer of Health. Such a bill, if passed, would affect Toronto and a number of other places where medical inspection of schools is at present under the control of the Board of Education.

IN Toronto Public Schools during the month of November, 510 children received complete dental treatment at the Municipal and School Dental Clinics and 242 at the hands of the family dentist.

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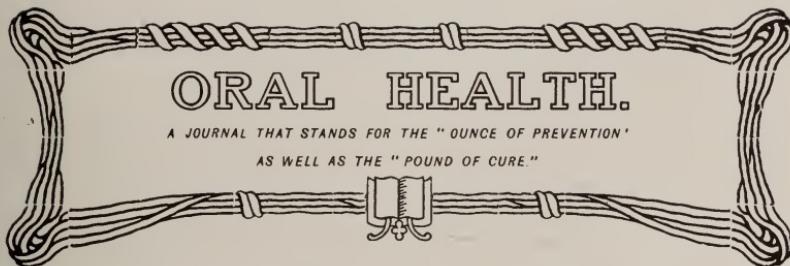
"Find your
purpose and fling
your life out into it ; and
the loftier your purpose is, the
more sure you will be to make the
world richer with every en-
richment of yourself."

Phillips Brooks



W. E. STRUTHERS, B.A., M.D., M.R.C.S., L.R.C.P.

CHIEF MEDICAL INSPECTOR, TORONTO PUBLIC SCHOOLS



VOL. 4.

TORONTO, MARCH, 1914

No. 3

Professor Gysi's System of Anatomical Articulation.

By W. E. CUMMER, L.D.S., D.D.S.

Professor Prosthetic Dentistry, Royal College of Dental Surgeons Toronto.

SYNOPSIS OF STEPS ALL VULCANITE DENTURES,
FULL UPPER AND LOWER.
(*Double Vulcanization Method.*)



1st Sitting—

Examination.

Impressions.

Shade. Time $1\frac{1}{2}$ hrs.

1st Interval—

Time $\frac{1}{4}$ hr.

Models.

2nd Sitting—

Examination of mouth for hard and soft contours in centre of model, $\frac{1}{4}$ hr.

Fixing wax on shellac base and proving, $\frac{1}{4}$ hr.

2nd Interval—

Flask, pack, vulcanize.

Fitting, etc., of vulcanite base plates, $3\frac{1}{2}$ hrs.
(Estimate of E. T. Campbell, Toronto.)

Dr. W. E. Cummer

3rd Sitting—

1. Build down upper trial plate in wax 2 MM past lip in repose parallel to occlusal plane, sandpaper, oil and chill, cone of wax on distal part of upper trial plate.
2. Build up lower, keeping upper hard and lower soft, have patient "close" till intermaxillary distance correct, by profile.
3. Remove, chill, and test for uniform contact.
4. Restore facial contour.
5. Mark high lip line.
6. Mark median line.
7. Mark angle of mouth.
8. Attach horse-shoe plate to lower.
9. Vaseline horse-shoe plate, and warm upper wax border, have patient "close," then level off wax projections with knife, admitting of side movements of lower or upper (depending on time spent on facial contour, 1½ hr.).

(Recording Movements of Mandible.)

10. Place upper and lower trial plates in mouth and attach large register to horse-shoe plate.
11. Place ends of vertical pencils over heads of condyles record lateral movements of mandible on ground glass.
12. Place ends of horizontal pencils opposite marks on face over heads of condyles. Fasten tight in these positions.
13. Mark on a visiting card the forward condyle paths in lateral or opening movements. Fig. 39.
14. Remove large register *without disturbing pencils*.
15. Fasten the incisor register to the upper trial plate.
16. Black-wax front of horse-shoe plate.
17. Put upper and lower trial plates into the mouth and record lateral movement of region of incisor.
18. Fix normal bite of lower mandible with pin of Incisor Register in apex of pointed pattern, by means of flat metal staples.
19. Dismiss patient after shade of teeth has been verified.
Time ½ hour.

3rd Interval—

(Mounting Models on Articulator.)

1. Temporarily wax the plaster models to the trial plates, put a rubber band around all, connect with large register, slide on articulator.
2. Trim plaster models vertically until Fig. 45 is possible.
3. Tie plaster models, trial plates, and horse-shoe pattern firmly together with a cord. Soak models in water, attach to Condyle Path Register.

4. Stand articulator with curved Incisor Guide Pin, which must not protrude above the top of the opening, holding it on a glass slab, pour plaster on lower bow, and then put base, register, and models together in their proper places, as in Fig. 45 with the tips of horizontal pencils at the same level as the points of the condyle pins of the articulator. $\frac{1}{2}$ hour time. (Including plaster set.)

(*Setting the Articulator to Recorded Measurements.*)

5. Remove Condyle Path Register and cut cords, trim plaster, etc.

6. Measure records made on the ground glass plates, Fig. 37.

7. Adjust fossae to reproduce the lateral movements.

8. Measure the records of the card board, Fig. 41.

9. Adjust glenoid fossae of articulator to reproduce forward and downward paths of condyles.

10. Place piece of wire or wood between models.

11. Liberate pin of Incisor Register so that it may follow the pattern in wax.

12. Place rotation points at outer ends of paths.

13. Make lateral movements of articulator and push rotation points inward or outward until Incisor Register follows the outlines of the pointed arch in the blackened wax.

14. Fix the rotation points in position. 15 minutes.

4th Sitting.

Mounting Teeth.

1. Grind teeth as indicated. Fig. 48. 15 min. Prof. Gysi's time.

2. Set upper anterior six, try in mouth, alter by stains or grinding for desired artistic results. Alter balance of teeth by these. Time 1 hr.

4th Interval—

1. Separate models 3 MM by raising upper bow on guide pins and refasten.

2. Place back eight upper as per Fig. 49-51.

3. Place lower second bicuspids, alternating from right to left, giving each tooth lateral and protrusive movements till approximately correctly located.

4. Set lower anterior six.

5. Reset guide pin to original position, heat all teeth but upper anterior six, gently press home, alternating occlusal and articulating positions, automatically correcting positions of teeth. Time 1 hr.

6. Wax firmly, insert carborundum powder and glycerine, grind $\frac{1}{4}$ hr.

5th Sitting—

Try in. 15 minutes.

Interval—

1. Vulcanize and finish. 8 hrs. (Estimate of E. T. Campbell, Toronto.)

2. Return to articulator, regrind with carborandum powder and glycerine. 15 mins.

6th Sitting—

Insert. 15 mins.*

These estimations of time consumed are based on a minimum time of a fairly expert and experienced operator. They are based on the actual producing time at the chair, exclusive of sterilizing, changing patients, etc. They are also based upon a comparatively simple case using, as already stated, the double vulcanization method (vulcanizing base first, erecting trial plate upon this, and subsequently vulcanizing the teeth upon the already vulcanized base). The greatest variations in time are most likely to occur (a) in the first sitting; difficult impressions with special trays might be three hours instead of one. (b) In the third sitting, obtaining of harmonious facial contour, often consumes a good deal of time, increasing time from one to two or two and a half hours. (c) In the third sitting the shade and form of teeth sometimes consumes a considerable amount of time over the time estimated. (d) In the fourth sitting, the harmonious setting, grinding, staining, etc., of the anterior sixes and occasionally occupying much more time for that sitting; instead of half hour three hours might be consumed. (e) In the fourth interval, until experience is gained in grinding the teeth, fifteen minutes (Prof. Gysi's time) will be insufficient. (f) In fourth interval, time allowed for setting back eight and upper and lower and anterior lower six in many cases is insufficient. Mr. E. T. Campbell's first estimate (vulcanizing two bases) allows $1\frac{1}{2}$ hours for vulcanizing and the same time for flasking, packing and sandpaper finish, which is sufficient for these. In his second estimate is included one hour for carving wax, $1\frac{1}{2}$ hours vulcanizing, and the balance in investing, boiling out wax, polishing, etc., and in each case the setting of plaster is included.

Dr. Essig's Clinic—

One of the most interesting and instructive features of the course was a demonstration by Dr. Norman Essig, of Philadelphia, son of the late Dr. Charles J. Essig, late head of the Department of Prosthetics, University of Pennsylvania Dental School, on the artistic grinding and stains of artificial teeth to imitate natural teeth. By way of introduction the doctor passed a number of anterior sixes, upper and lower, mounted in modeled wax gums and asked individuals in his audience to pick out the natural and artificial without looking at the lingual side. Without exception each member of the class was unable in every case to make the distinction. The doctor then proceeded to outline his method. He usually chooses a tooth slightly too large and too light in shade, and proceeds to grind off the glaze, using a carborandum stone of C or D grit, finishing with sand paper disc gringing (Fig. 59) in a root as shown in sketch,

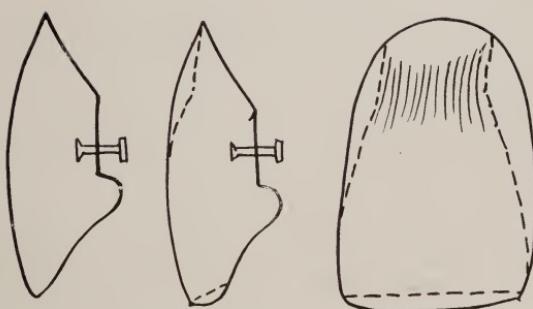


Fig. 59

Showing alteration of a stereotyped form of artificial tooth to one showing proper individuality. Dotted lines showing form obtained by grinding and finishing with sandpaper disc. Dotted lines across incisal edge indicates grinding to imitate wear or as it is sometimes called "ageing."

giving the crown a form in harmony with the characteristics of the face, and the age of the individual. This completed the clinician showed a simple means for obtaining faint vertical or horizontal lines seen in cracked natural enamel. A thin separating saw is drawn across the tooth in the location wanted, and the color rubbed in with the finger. For white or colored spots a shallow depression is ground in the porcelain and the color applied and baked. This having been completed, a shade which, when overlaid on the porcelain will produce the predominant shade of the tooth, is mixed, applied with a brush and blended by drawing the finger across. By these simple means most life-like results are obtained. The colors used by the clinician were Le Croix oil china colors, obtained from any art goods store, already mixed with oil and in tube form. The colors were as follows: Ivory, yellow, rose pompadour, celestial blue, brown yellow, brown sepia, ivory black (thin wash for grey color), and relief white. Oil of lavender is used as the thinning medium. Some experience in mixing is needed, for the colors fire several degrees lighter, and require a dull red heat in the furnace for a minute or two. To polish surface after firing oxide of tin or pine spool in lathe was recommended.

Dr. Ulsaver's Clinic.

Dr. E. J. Ulsaver, of New Rochelle, gave a clinic along similar lines to the paper read before the Toronto Dental Society by Dr. Lowe Young, advocating the careful carving of natural grooves and cusps in inlays in order to prevent "meat holes" and to obtain the highest masticating effi-

ciency. This work is done by the indirect method, i.e., impressions of cavities in Kerr Compound in Roach Trays and amalgam dies mounted on an articulator with a wax bite, and cusps and especially the proximal marginal ridge carved in the wax with greatest care, and are cast, polished returned to model, polished upon it and then fitted and cemented home.

Dr. Clapp's Lecture on Economics.

Dr. George Wood Clapp, delivered two lectures to the class on the subject of Economics in which he added a large amount of data on the economic side of office administration, etc., and the fundamentals which govern this. As these lectures will be published shortly in the *Dental Digest* further enlargement would be superfluous.

In conclusion the writer would express his appreciation of the work of the instructors of the class and to state again his belief that the work of Professor Gysi marks an epoch in the history of Prosthetic Dentistry and will always be to him an inspiration, as to the others, sharing the privileges of the class.

Resolution.

On the Death of Charles A. Meeker, D.D.S., Ex-Secretary of the N. J. State Board of Registration and Examination in Dentistry.

WHEREAS, in the providence on an All-wise Creator, our fellow-member, Dr. Charles A. Meeker, died September 8th, 1913; and

Whereas, his indefatigable industry, his record as an examiner, his skill as an organizer and systematic developer of the New Jersey State Board work for a period of time covering twenty years has placed him without a peer among eminent examiners; now therefore be it

Resolved, That we, the members of New Jersey State Board of Registration and Examination in Dentistry, deeply deplore his loss, and express our great appreciation of his long and intelligent services; and be it further

Resolved, That a page of our Minute Book be inscribed with these resolutions, and a copy of the same be sent to his bereaved widow, and to the professional journals for publication.

(Signed) HERBEET SANDS SUTPHEN, D.D.S., President.
 ALPHONSO IRWIN, D.D.S., Secretary.
 WILLIAM E. TRUEX, D.D.S.
 VERNON D. HOOD, D.D.S.
 CORNELIUS KIEL, D.D.S.
 CHARLES P. TUTTLE, D.D.S.

Silicate Filling.

By W. B. T. AMY, D.D.S., TORONTO.

(*In our last issue we published a paper by Dr. Clyde. . . . Davis, read before the Toronto Dental Society, upon the subject of "The Ideal Filling." Dr. Amy introduced the discussion of Dr. Davis' paper. The present paper by Dr. Amy embraces his discussion upon that occasion, as well as covering some further material upon the subject of Silicates.—Editor.)*

I T was with extreme reluctance that I consented to offer any criticism on Dr. Davis' paper. In the first place, I did not feel competent to pass judgment on a paper prepared by a man so well known as a thinker and doer as Dr. Davis; and in the second place, I knew that in the time at my disposal it would be impossible for me to either affirm or refute, by personal experiments, many of the statements he might make. In spite of all this, I consider it a pleasure to have the privilege of thanking Dr. Davis for this paper which, if it does nothing further than arouse a full and free discussion of all silicate cements, will be wholly worth while.

There is no phase of dentistry in which we are more interested at the present time than the search for the ideal filling, though I doubt much if the ideal will ever be found. What is man's ideal to-day is his discard to-morrow. After all, ideals are a matter of education and environment.

The first filling material that even approached what we might call the ideal was the porcelain, and in some dentists' hands it is still almost the ideal, especially in so far as the anterior teeth are concerned. I have seen porcelain fillings in almost all locations in the mouth that, after years of usefulness, still looked good for years to come; these, too, by men who have practically abandoned this kind of filling. One regrets that owing more to unskilful operators than to any fault of the material itself, it has fallen into ill-repute.

The latest attempt at a near-to-nature filling material is the silicate cement. While each of us no doubt has his favorite among the various kinds manufactured, the peculiar

thing is that possibly all of us have some good fillings from each kind that we have tried. Why there are some good and so many bad it is hard to say.

In my hands the "synthetic porcelain" has been by far the most satisfactory, both as regards shade and permanence; even in locations on which Dr. Davis has put the ban it has stood the test of time. But because it has stood the test on incisal angles in some mouths it does not follow that it is a good filling for incisal angles in all mouths. To be perfectly certain of good results, be careful what cavities you select for filling with this material.

In mixing the "synthetic porcelain," I follow pretty closely the instructions of the manufacturers, and find, for all my purposes, that, mixed to a point where the lustre disappears and the adhesiveness almost, it is at the proper consistency. As soon as the mix is carried beyond this, crystallization takes place so rapidly that there is not sufficient time to put the filling in properly. Any manipulation of the mass after crystallization has begun is disastrous to the future welfare of the filling. The length of time elapsing before crystallization does take place varies with the temperature of the room, the temperature of the mixing slab, and in some silicates with the different batches of material. I did not find the other silicates anything like as uniform in their mix as the synthetic.

In all cases I prepare the cavity before putting on the rubber dam. After the cavity is prepared and all shades and necessary instruments are within easy reach, the dam is fixed in place, the cavity wiped out, a lining inserted, and the mix begun. I may say here that I have in my possession but four shades—yellow, dark yellow, grey and light; these I have found sufficient to enable me to mix any shade I have come across so far. The time necessary for the mix is not of sufficient length to make any appreciable difference in the shade of the tooth through dehydration, and the filling material, if properly inserted and protected, shows the same shade as in the mix; so that when the rubber dam is taken off, the filling and tooth will match, providing your eye has been true.

When inserting the filling I always use the thinnest celluloid strip I can obtain as a matrix, so that I can produce as nearly as possible the original contact point. Against this strip and into the cavity I pack my filling material, using

agate instruments for this and for forming the labial walls. This technique refers more particularly to mesial or distal cavities. In labial cavities, situated gingivally, I do not attempt to put on the rubber dam, but dry out the cavity and gum, coating the latter with the collodion to prevent seepage of moisture.

The cavity can now be filled as usual, but without the use of the celluloid strips. After coating with cocoa butter, I allow the filling to harden for possibly ten minutes, generally longer. I finish with cuttle-fish strips and discs coated thinly with cocoa butter, after which I wipe off the butter, coat with varnish or wax, and dismiss the patient with instructions to brush her teeth in a couple of hours to remove the coating.

I notice with some surprise that Dr. Davis, method of treatment of the "synthetic porcelain," after it has been carried into the cavity, is somewhat different from the one he advised before the National Dental Association. There he advocated the use of the mallet altogether, while in this paper patting seems to be the preferable method. Explanatory of this, Dr. Davis stated before the Toronto Dental Society that the malleting he referred to was in reality a jarring process, and that the same end could be attained by patting. Dr. Davis makes the statement that in the mixing of the "synthetic porcelain" we are dealing with a physical condition like unto sand and water. To me the conditions are not at all similar.

When the liquid and the powder of the "synthetic porcelain" are brought together, a chemical compound is formed, while the sand and water do not unite in any way. In another place Dr. Davis states that the homogeneousness of the mass depends, at least to some extent, on the patting or puddling of it before it leaves the slab and after it has been inserted into the cavity. To my mind the patting of the mass on the slab is but a means of knowing whether the mix is of the proper consistency, and after the mass is in the cavity we pat it or press it to be sure that the filling has reached every part of the cavity, and to secure the contour. If the homogeneity of the mass is not secured by spatulation when making the mix, it cannot possibly be obtained by any means we may adopt afterwards. Be exceedingly careful in incorporating the powder with the liquid during the mix, as many of the ordinary mixes examined under a powerful

microscope will show numerous particles of powder which have not been taken up by the liquid; this is a frequent source of discoloration and the cause of many a failure.

As to the use of steel instruments, I would not say that their use at a certain stage would result in discoloration of the filling; but I would say that they are not a necessary feature of the finish, and I fear their use at any stage might result in injury to the margins of the filling.

I feel that I should not close these rambling remarks without taking some exception to the classes into which Dr. Davis has divided our profession. I am at a loss myself to know which class to join. The sailors in the rigging are too reckless an aggregation for me in such a storm; those occupying the main deck do not get enough ventilation on such a tempestuous voyage as the one the Doctor has described; and the "Billy Goats"—if they are anything like those I have had any near acquaintance with, they are no fit company for man or beast.

I am inclined to think that the Doctor's ship is not the proper boat for many of us to take passage on; there are too many maids and marriageable females aboard. The sailing name of his ship must be "Courtship." With many of us that ship has been dismantled; the storms have swept away the rigging; the forecastle has been carried out to sea; the name has been changed to "Hardship," and nothing remains but the battered hull, where many of us are clinging, strenuously striving to fill its leaky cavities with anything we think will carry it safely over the shoals into the harbor.

Professional Efficiency.

BY MARK G. McELHINNEY, D.D.S., OTTAWA.

ONE of the good things pertaining to dental conventions is that suggestions for new subjects continually arise during the discussions of the ones on the programme.

At the recent Oral Hygiene Convention in Toronto, there were two such subjects broached, but time did not permit their discussion. Someone mentioned that the supply of dentists in Ontario was less than the demand for service. Someone else wanted to know the reason for this state of affairs. This would suggest the subject, "Why Does Our Profession Fail to Attract More Young Men?" The second suggestion arose out of a very short and veiled mention of the too-prevalent existence of inefficient men in all professions. While I would like to be permitted to discuss the first at some later date, at present I would crave your attention to the second subject.

In endeavoring to reach the reasons for shortcomings, abuses or failure to produce the highest standard of production in any line, the only sure way is to get down to the fundamental facts and analyze the means and methods of that production.

In dentistry, the method of production is the College, and the fundamental fact is the young man who enters its portals. The same is true of all professions and other vocations in life.

The young man is the material from which the practitioner is made, and in spite of the most excellent methods of education, the most gifted and earnest teachers and the unconscious ethical impress of the profession at large, the output will be modified by the quality of the material. Our College is, we believe, equal to any other in equipment, in methods and in the personnel of its staff, so that any criticism of the output could not justly be laid at its doors. If, then, the output is not in every case up to the standard of efficiency, as some claim, and not unjustly, we must then examine the material from which we make the dentist and the means by which he comes our way.

To-day the College doors are open to any young man or woman who can show evidence of requisite matriculation, and possesses the means to pursue the course. The matricu-

lation also resolves itself into a question of means, so that, to put it bluntly but truthfully: the profession is open to those who have the price. The reasons for entering the profession are not questionsd, whether they be ethical, social or purely and solely commercial. This is why, despite all other conditions, the output is so irregular in efficiency. This is how many young men choose a profession. They must do something for a living, but feel no urgent call in any one direction. Emolument, social position, hours of labor, nature of work, and many other elements in the various callings are reviewed and subjected to the test of the personal choice, and in the necessary ignorance which must enshroud the real life of any calling, a choice is made. Perchance the choice is Dentistry.

Details are arranged and the long-suffering professors receive an unknown quantity, from which they must mould a dentist. Sometimes this unknown quantity proves to be a cypher, but that it is usually of some real value is attested by the position of the profession to-day.

I am leaving out of this discussion those who work their own way, for they stand in a class by themselves—a class which very rarely fails to rank high in ultimate attainment. While leaving them out, I admit that it is their invariable success which is the strongest argument for the scheme of education which I desire to present. I am aware that the scheme is not new; that is has been tested in isolated colleges, and has not failed in its objects.

In my opinion, the higher education of any nature should not be purchasable for a price, but should be obtainable by any who feel called toward it, and are willing to make a sacrifice to get it. To-day many who lack the true incentive, having the price, receive it, and many more, having every incentive, lack the price and are denied. This is not for the best development of the professions and of the nation at large.

The ideal college would be one at the door of which all would be equal, the only requirements honesty, energy and intelligence. It should not be possible for the richest to purchase an education, or for the poorest to go without it. The only price should be the ability to earn it.

To the present college there should be added a sort of industrial annex, in which every student is expected, or rather, obliged, to earn his keep, clothing and tuition, keep his accounts, and otherwise act as a self-supporting and effi-

cient member of society. By requiring this of all, no social stigma could attach, and the inefficient would be weeded out in the first term. The result would be an industrial training which would give a clear insight into the value and conditions of labor, a requirement of good citizenship; a knowledge of business and personal economy which should ensure his financial success, and finally a profession of his own attainment at a cost which would so enhance its value that there could be no question of his professional future. If this system were ap lied to all higher education, progress would no longer creep; it would make giant strides because the elements of progress would all be fit.

I know that this scheme may appear revolutionary and quixotic to many. All suggested progress does at first, and afterward we wonder why. In 1800 most of the elements of modern civilization were undreamed of, except by a few theorists. Time reckons not of revolution or custom or seeming impossibility, or of the quaking fears of the timid. Time goes on, destroying the old and inefficient methods, signing the warrants for the newer and better, and generally playing havoc with our little theories of the intentions of Providence. Time brought Democracy, the Science of Evolution, Freedom of Thought and Speech, General Education, and Time will bring a wider Freedom, better Economic and Social Conditions, and, with them, a more just and more efficient form of Higher Education.

Oral Hygiene Reports.

Birmingham, Ala.—

Dental inspection is made by the local dental association and a free clinic is being operated for indigent children—or to be more correct, children of indigent parents.

Dallas and New Orleans schools have free dental inspection.

Tuscaloosa—

In the Tuscaloosa schools the children of the primary grade are required to clean their teeth before coming to school. If on questioning them the teacher finds that the teeth have been neglected, she gives the children a low grade that brings down their general average. There is also arrangement for a tooth brush drill.

Gold Inlays.

BY R. H. CHANT, D.D.S., FOAM LAKE, SASK.

I HAVE nothing new to offer upon this subject, but feel that it would be helpful to draw attention to some features in the technique of making gold inlays.

Unfortunately many operators have been so carried away with enthusiasm for the gold inlay, that they make inlay restorations in every case without regard to the indications. In some cases the use of the inlay has been carried so far that operators have been known to put away their pluggerpins and indiscriminately use the inlay method for all restorations.

Every case that presents itself should be carefully considered and the indications should determine whether an inlay or a gold foil restoration be used. There are many cases where gold foil is contra-indicated as there are also many cases where the inlay should not be used. For example, where peridental trouble is present we should not use foil, and in cavities which extend bucco-lingually in the gingival region, inlays are out of the question.

The inlay was announced to the profession as a very simple and rapid method of restoring lost tooth tissue. Many men have the impression that the inlay method consumes much less time than foil filling, but, personally, do not think this is true.

In preparing the cavity for an inlay the easy removal of the wax should not be the whole object. If the walls are left diverging and not practically parallel the inlay will lose much of its retentiveness and its resistance to mastication.

In preparing the cavity it is also necessary to keep in mind that the walls should be extended, that the excursions of food over the margins may keep the filling clean, thus minimizing the possibility of further decay at the margins.

The contact point and the gingival margin are the two locations that should receive particular attention, and these are the very places where the advantages of the inlay over the foil filling are evident. In the case of an inlay, if, after casting, the contact point is not just as you want it, it may be built up with a high karat solder before cementing it in place.

The waxing of the inlay is just as important as the pre-

paration of the cavity, and this is the part of the operation where the failure or success of the inlay is usually determined. It requires close observation and technique to get a perfect wax model. We should use wax which is hard at the temperature of the mouth, thus the chances of distorting the wax model are reduced to the minimum. We must be very careful to get perfect adaptation of the wax at the gingival wall. This is where most inlays fail. After the wax has been pressed to place and trimmed, I find a fine cuttle fish strip, carried to the gingival, is a great help in bringing the wax into close contact with this wall and holding the wax firmly in position during this step. Failures at the gingival are usually due to faulty technique, not to shrinkage which is oftentimes blamed.

Very large inlays have a great deal of shrinkage, and we can overcome this difficulty by making the inlay in sections. In mesio-occluso-distal cavities we can make the disto-occlusal half and cut a dove-tail into the occlusal part of this, and then take a wax model of the mesio-occlusal and cement to place. In occlusal-bucco-gingival cavities we can make the gingival cavity and cut into this and make the buccal-occlusal part binding in the gingival inlay. In bicuspids where we have a mesio-occluso-distal cavity a staple made of 16 or 18 gauge metal may be used. The wax is molded around this and no trouble is found in removing the wax model.

Another possible difficulty in these large cavities is the wearing and crushing force, causing the inlay to lose its original contour. This may be overcome by flowing a little solder over the occlusal surface. With the foil filling the malleting hardens the gold sufficiently enough to overcome this weakness, which is frequently manifest in pure gold inlays.

The process of casting has given all of us trouble at different times, particularly imperfections, due to faulty investment and casts having rounded edges. The imperfections of casts are usually due to air confined in the investment or between the model and investment. If one uses the ordinary rubber plaster bowl and mixes the investment in proper proportions, jarring it well and revolving the bowl at the same time, one may easily get rid of the bubbles. The rounding of the edges in the cast is due largely to not having the gold hot enough to flow. It should be in a very liquid form to cast properly.

Inlay work has been a step of advancement in dentistry. A thorough knowledge of the basic principles and their proper application are sure to bring good results. As in everything else in the practice of dentistry we must be thorough as there are no easy roads to success.

A great deal has been said with regard to inlay cements. My impression is that cement is not our greatest difficulty in inlay work. If we have the cavity prepared along the proper lines we will have very little trouble with the cement holding the inlay in position. It is to be hoped that varying opinions on the Technique of Inlay Work may be cleared up when much more satisfactory results are sure to be secured.

Are Dental Services Legal "Necessaries?"

CHE question as to how far a husband is liable for "necessaries" supplied to the wife on a contract with her without the knowledge of her husband frequently arises and the law is now well settled on that point. The Cyclopedias of Law and Procedure, Volume 21, Page 1215, summarizes the question as follows:—

"Coupled with the common-law duty of the husband to support the wife is his liability for her necessaries suitable to his circumstances and conditions in life. Should he fail in supplying her with such suitable necessaries, she may, while cohabitating with him, or upon his desertion of her, bind him by her contracts with third persons for such a purpose. This right of the wife's to pledge the husband's credit, when un supplied by him, is generally founded upon the doctrine of the wife's implied agency. Some have called it an agency of necessity. But it is perhaps a clearer view to regard it as a personal, inherent right of the wife recognized by law, when the husband fails in the duty imposed by the law upon him; since if necessaries are furnished the wife, even against the husband's will, he is liable, when he refuses or neglects to furnish them."

As to what are "necessaries" a large number of cases have been decided, holding that the term includes food, clothing, lodging, household supplies, medical services, etc., but

the question as to whether dental services furnished the wife are "necessaries" within the meaning of the term is apparently a rare one, and there only seem to be two cases on the point—both decisions by American State Courts, which would no doubt be followed in Canada.

The first case, Gilman vs. Andrus, is found in 28 Vermont Reports 241, the other, Clark vs. Tenneson, in 146 Wisconsin 65. Both were cases in which the dentist had supplied the wife with artificial teeth without any contract or agreement with the husband, and the decision in each case was that the articles furnished constituted "necessaries" for which the husband is liable.

In the former case the court held:—

"The plate was furnished while the defendant and his wife were living together, and was suitable to the defendant's circumstances and station in life. It is expressly found that the defendant permitted his wife to keep the plate after it came to his knowledge that she had procured it of the plaintiff. The fact that the defendant did not then repudiate the contract and cause the plate to be returned, will render him liable for what it was reasonably worth.
"Those circumstances in connection with the fact that he has permitted his wife to retain the plate during the whole period of their cohabitation, are sufficient to show her authority to make the purchase, and the defendant's liability, even if the plate could not strictly be treated as necessities. We are satisfied, however, that the defendant is liable upon either of those grounds."

In the Clark case the Court said: "This Court has declared what in general constitute 'necessaries,' which a husband is bound to furnish to his wife, and declare that they embrace the usual provisions for the maintenance of the wife's health and comfort appropriate to her mode of life, in view of their social standing and station and his financial abilities. It is a matter of common knowledge that artificial teeth are most useful and necessary articles for the promotion of personal comfort and health, and that their use in this country has attained practical universality. We consider that such teeth come within the class of articles constituting 'necessaries' which a husband may be bound to furnish his wife."

The Economic Value of the Deciduous Teeth.

BY M. EVANGELINE JORDON, D.D.S., LOS ANGELES.

CHE environment of the American people has entirely changed within the lifetime of one generation, and the connection between the environment and the teeth has not yet forced itself upon the minds of the public. A perfect dental equipment is one of the best gifts to mankind, and environment is one of the great destroyers or preservers of the dental equipment. This was recognized when a parallel was drawn between the perfect denture of Sitting Bull, who had lived the free life of the plains, and had eaten the simple, primitive foods, and the broken, carious teeth of his grandson, who had suffered from the conditions of civilization.

Our change of environment has been slow, but that it is just as fatal is shown by school examinations in different cities, where the number of children needing dental care runs from 75 per cent. to as high as 97 per cent.

The value of the teeth with regard to the state, that is, the effect upon the health of society at large and upon the taxes they must pay, is but little realized by the profession and is not even imagined by the laity. In his last report Dr. Ebersole, the chairman of the National Committee on Oral Hygiene, tells us that when the mouths of the school children are put into a healthy condition they can do 20% more work. The lack of such work, he estimates, is an annual loss to the taxpayers of the city of Cleveland of half a million dollars. Cleveland is one city in the United States, and conditions are similar in all communities.

This is only one way in which neglected teeth may increase taxes. The cost of caring for the young criminals might be greatly lessened by keeping the mouths of the poor children in a healthy condition. We should then have fewer young criminals because workers in juvenile courts find carious teeth one of the predisposing causes of viciousness and delinquency. Often these children become honest and upright when their mouths are made healthy. A step farther and the cost of maintaining prisons, courts, and penitentiaries would be lessened if there were fewer criminals.

growing up to fill them.

Hospitals are a great expense. Those who work in clinics for tuberculous children tell us that such children always have carious teeth. Go into any hospital and examine the mouths of the inmates and you will be satisfied that if their teeth had been kept in repair many of them would not need to be there.

Another heavy item of expense to the taxpayer is in maintaining asylums for the insane which each year are being more crowded. Some of the unhappy people would be well and self supporting if their teeth had been cared for, but now they are a tax upon the people.

And last but saddest of all, when old age is reached many people must be cared for by the state because they were unsuccessful in life. One-fifth, or more, of their strength was lost by neglected teeth.

This is needless waste and is largely due to the fact that people think because the deciduous or baby teeth are to be shed that they need no care. Nothing was ever farther from the truth. These teeth are needed for use between the ages of two and twelve and under our present state of civilization every dollar spent in keeping the mouth in perfect health during this period brings better returns in health and strength than three dollars later on.

It was recognized very early in the study of the causes for carious teeth that the child who was raised at the mother's breast had better teeth, better shaped jaws, and was probably freer from adenoids and enlarged tonsils, than the bottle fed baby. It remained for dentists practicing exclusively for children to discover the very serious results that may be traced to bottle feeding. The first of these is the early decay of the teeth before the second year. This may usually be traced to the lactic acid action upon the upper incisors of the children who had been fed upon bottle food that is too sweet, such as condensed milk, goat's milk, etc. In these cases a stain appears upon the teeth during the last part of the first year and in a few months these stained areas deepen into cavities often causing the teeth to be broken down to the gums by the middle of the third year. If the child has care the abscess which follows the growth of the cavity and the death of the pulp may be treated and the tooth filled and restored to usefulness.

My records show many such cases of children ranging from eighteen months to two and one half years of age.

Each of these children needed besides such treatments several small fillings in other teeth which if neglected would have gone through the same destructive stages of inflammation of the bacteria invaded pulp, its death and suppuration, and later alveolar abscess, followed by a necrosed area of the alveolar process surrounding the root.

Possibly the busy physicians have overlooked these apparently little trifles without realizing how prevalent and how serious are the dead pulps in children's teeth. An abscess upon the finger is a serious thing, but how much more serious it would be considered if its discharge were all carried into the system. Where there is one tooth with an abscess another will soon be in the same condition because mastication upon the approximal and occluding teeth becomes difficult and painful and the destructive bacteria burrow toward the pulps of these teeth with less disturbance from the food.

The blood is laden with pus germs absorbed directly by the tissues surrounding the roots of the teeth and also by the way of the stomach and intestines because the slightest pressure upon the tooth squeezes great drops of creamy pus into the food being prepared for digestion. Each tooth with an abscess reduces the resisting power of the child until when there are five or six or even seven, as one of my little patients of three and one-half years had, great quantities of pus are absorbed daily and very little resistance is made against the poisoning. Many a little grave, yes thousands of little graves hide the victims of septicemia, although the child appeared to succumb to some simple ailment.

The little patient suffering with seven abscesses was brought from a neighboring town and referred to me because the dentists who had examined her found her extreme irritability a hindrance in doing satisfactory work for her relief. In six weeks her teeth were filled, but for several months pus would reappear at some point of the necrosed areas about the roots. These all finally healed and at a recent visit after a year's absence her gums were perfectly healthy and her teeth all in service. A year and a half ago she passed through a serious run of typhoid fever where her physicians say she could not have escaped death had her mouth not been in a perfectly healthy condition.

Generally conditions of this sort are brought to the attention of the physicians first, and if they do not recognize them the blame should rest at their door. Some do recognize the danger from the pus and extract the tooth, or teeth,

without recognizing the injury they may be doing to the proper occlusion of the permanent set. Never extract a deciduous tooth except for its immediate successor is an axiom in dentistry, and should prevent the early sacrifice of these teeth which may easily be restored to health and usefulness by a few simple treatments.

The prolonged use of the nursing bottle causes the upper arch to grow high and narrow which results in a permanent lengthening of the face and malocclusion of the arches. The upper front teeth may project and prevent the closing of the mouth. In such cases the child may breathe through the mouth and is then subject to inflammation of throat and tonsils. The air passages of the nose become smaller and the growth of adenoids is induced. If the upper teeth are broken off very early the lower jaw, having no support, may sag forward and remain in the protruding position.

Where artificial feeding cannot be avoided the watchfulness of the mother may do much in the prevention of these troubles. The nose must be kept clean so that there is no obstruction to free breathing. The bottle must be taken from the child as soon as empty and pacifiers must never be used. The mouth must be kept very clean, and as soon as the teeth appear they must be kept free from stain. If the food is sweet, magnesia helps to counteract the acid, and to keep the stomach more healthy.

The deciduous teeth are for use during the time of greatest development of the child, and the shortest lived of these, the incisors, should last for six years. The molars which are replaced by the bicuspids should be in use for eight and ten years, and any interference with the usefulness of these teeth interferes with the nutrition and growth of the child. It may not always show in the physical appearance, but it always interferes with the nervous system. Children whose teeth have been badly neglected are frequently the victims of a serious breakdown which often becomes most apparent as they approach puberty.

Dentistry like education should be begun in childhood. If prophylactic work is begun before any stains appear upon the teeth and is carried along without interruption there is every reason to believe that there never will be even a roughening of the enamel of a single tooth. The exception to this rule is where the child is a victim of severe malnutrition due to some extreme febrile disorder as the result of scarlet fever, diphtheria, measles, etc., or syphilis, in which case the

growth of the teeth may be stopped during the development of the enamel and result in atrophied teeth, those misshapen stunted teeth, so difficult to preserve and so much less useful because of the small surface of occlusion.

The first permanent molar is most often the victim of atrophy and may generally be traced to such a disturbance occurring between birth and the third year. The preservation of the first permanent molar is one of the great problems in dentistry. Erupting in the sixth year it is generally mistaken by the laity for a deciduous tooth. When the mouth is full of caries this tooth often begins to decay before it is fully erupted. When caries reach the pulp before the tenth year it is almost certain to be lost as the roots are not completely formed until nearly four years after eruption.

One of the greatest mistakes made is to think that this most valuable tooth of the second denture can be permanently filled before puberty. I can safely say that fully as many teeth are lost, as saved, when filled with silver amalgam in childhood. Prior to puberty we frequently find an acid saliva depositing the destructive coating of mucus upon the teeth similar to the conditions during the early months of pregnancy. Then the bacteria penetrate between the wall of the filling and the tooth and protected by the filling develop great colonies which undermine the tooth and penetrate the pulp while externally there is no sign until the whole tooth suddenly falls to pieces like the collapse of a building with a weak foundation.

The teeth like the forests and rivers of the nation are one of our greatest natural resources and should be understood and conserved with equal care, as much of the health and happiness of the nation depends upon their usefulness. Their conservation is one of the simplest and easiest matters when faithfully continued from babyhood to adult life.

Then all fear of dental work is unknown because if as the result of an illness some small cavities do form they are filled before they become sensitive.

Where prophylactic work is practised children not only lose all fear of the dentist, but look forward to their monthly appointments as a pleasant form of entertainment. Prophylactic work being done once a month a constant supervision is kept of the oral hygiene practised at home, and any mistakes in the use, or lack of use, of the brush can be corrected.

Many pregnant women are allowed to suffer with their teeth when the dental work necessary for their relief would

be far less injurious to the development of the child than the sleepless nights of pain which sap a woman's strength.

The poisoning from abscessed teeth or pus pockets about the necks of the teeth very seriously hamper the proper development of the child, and such conditions have been instrumental in causing premature delivery.

Prophylactic work for women during pregnancy when begun in the earlier months is doing much to stop the rapid caries common during that time and prevent the incipient pyorrhea alveolaris to which later the mouth of the mother so often falls a victim.

If the fear and the pain of dentistry can be relegated to the past with other plagues and horrors another step upward will be taken in the progress of science and eugenics.

Mouth Hygiene in the Public School Curriculum—Some Comparisons and Deductions.*

BY ALBERT H. STEVENSON, D.D.S.

Chairman Committee on Public Health and Education,
Second District Dental Society; Secretary Oral Hygiene Committee, New York State Society.

HAVE we, or have we not, been giving Mouth Hygiene its deserved place in the school curriculum? Decidedly, we have not, as health officers will attest and statistics will verify. The dissemination of disease can only be controlled by prevention, but how meagre is the attention given to that all-important source of many diseases—the mouth! As the most common physical defect in the school child (98 per cent. being the alarming average of the school inspection reports), bad teeth and filthy mouths have aroused more than one community to action. Public dental clinics, dental school nurses, and more careful inspection have been resorted to with success, but the most effectual means to the end—a revision of the present instructive methods in the Hygiene—appear to have been ignored. That much can be done toward the improvement

*Read before the Fourth International Congress of School Hygiene, Buffalo, N.Y.

of the child, mentally, physically, and morally, by remedying the condition of his mouth, has been proven. More will be added by unquestionable authorities at this Congress. That proper instruction in the Hygiene is the most potent preventive measure is an undisputed fact. Why, then, with all our modern progress in the major and minor subjects, has this received such scant consideration by our educators? Because no uniformity of rule nor systematic arrangement has been applied toward the establishment of a rational Hygiene of the Mouth. Until such a system is adopted, here and abroad, there can be no appreciable result.

An indication of the present status of mouth hygiene in the curricula of the public schools of the large cities of this country may be obtained from the following. This information was taken from the signed statements sent to the writer by the Superintendents of the Departments of Education of nine of the leading cities of the United States:

City	*Periods per week	Earliest grade taught	Dental inspection	Tooth brush drill	Text and Reference Books.	Public Lectures
Baltimore	2	1st	Yes	No	Conn's Elem. Phy.	Night School only
Boston	1	1st	Yes	Yes	Conn's-Jewett's Ritchie-Millard's	Yes
Cleveland	1	1st	Yes	Higher grades only	Gulick's Series	Yes
Newark	1	1st	Yes	Yes	Ritchie's Primer Krohn's Phy. Smith's Primer Gulick's Series	To Teachers Yes
New York	1	1st	Yes	Yes	Gulick's Series	Yes
New Orleans.	2	1st	Yes	No	Krohn's Phy.	Yes
Philadelphia	2	1st	Yes	No	Many	No
Seattle	1	1st	Yes	No	Ritchie's Primer Gulick's Series Woods-Hutchinson	No
San Francisco.	1	1st	Yes	No	Ritchie's Primer Caldwell's Primer	No

*Period—One-half hour Phy. and Hy.

It will be noted all have dental inspection and teach mouth hygiene from the first grade; however, but one-half an hour is allowed each week for the entire subject of physiology and hygiene in seven of the above cities, and but three have the tooth brush drill. Of the text and reference books cited not one contains mouth hygiene as it is understood and applied by the dental profession. The city of New York in its new syllabus in physiology and hygiene, prepared by Dr. C. Ward Crampton, has a graded system wherein, by proper correlation with other hygienics, the mouth is given its deserved importance. Dr. R. Ottolengui of New York City, together with the writer, in collaborating with Dr. Crampton, proved most conclusively the value of the tooth brush drill, and it has been incorporated in the syllabus. The city of Newark, N.J., has a series of practical lectures delivered to the teachers in the various centres, and by this means the teachers are prepared directly to teach the application of mouth hygiene in the classroom.

In instruction upon the subject two aspects, heretofore more or less ignored, should be emphasized. Firstly, the relation of the mouth as the vestibule of the body to the human habitation; secondly, the beneficial effects of a clean mouth upon the general health. Both these points, it will be noted, are of a positive nature and quite in keeping with modern pedagogics. The futile method of inspiring dread of a pain as a spur to cleanliness is ineffectual, obsolete, and should be discouraged. As the subject develops attention should be given to the brush, its size, shape and bristles, with warnings; the use of the dental floss; the dentifrice with cautions and advice, and, most of all, to the method of brushing and the frequency of the operation. As to the method of brushing, the most practical manner of instruction is the tooth brush drill. In this drill the teacher demonstrates to the pupils the correct use of the brush, using her own brush, dry, in pantomime, and the class doing the same. The children should be notified one or more days before of the intended drill, and to be prepared with their own brushes. The use of a large demonstrating brush and model is also a good method, though less effective. As to frequency, the children should be taught to cleanse their mouths after each meal and upon retiring. Physiological chemistry has proven conclusively that food retained in the mouth even an hour ferments and presents a putrefactive source of infection. Why, then, not teach the child how to keep

the mouth absolutely clean, and not set up a false standard of one or two cleanings per day?

Instruction should begin with the first grade or even in the kindergarten, in simple form, advancing apace with other subjects. With the knowledge that the mouth is the gateway through which passes all food, all water, and part of the air for our sustenance, will come a wholesome respect for this cavity. In proportion to this respects depends much of the future not alone of preventive dentistry, but preventive medicine as well; for, is classroom sanitation more important than mouth sanitation, or pure food laws more than pure mouth laws?

I plead then for universal mouth hygiene, uniform, rational, life-saving. Not the hygiene of clean teeth alone, but of clean mouths, at all hours of the day, in class or at play, and as far as possible during the sleeping hours of the child. The benefits of this condition are self-evident. With a clean and not a fertile field for bacteria; with a comfortable and not a disturbing mouth, how much more receptive will be that child for that knowledge which we have under difficulties been inculcating.

Lecture Outline Forms.

Second District Dental Society, State of New York.

OUTLINE OF LECTURE TO MOTHERS' CLUBS.

CHE following points seem to be the ones that need the most emphasis:

1. Show that the responsibility for the general health of the child depends mainly upon the mother, and that she should have sound ideas of how to conserve the child's health.
2. Bring out the influence that sound, clean teeth have upon the general health of the child.
 - a. Show how diseased and unclean teeth play a large part in the causation of disease. That the method of infection in the following disease is the discharges of the mouth: Tuberculosis,

- pneumonia, influenza, la grippe, diphtheria, measles, scarlet fever, mumps, etc.
- b. Show how lack of, or decay of the teeth cause mal-nutrition, mouth-breathing, adenoids.
 - c. Show how the pain of diseased teeth may be reflected and cause infection in the eyes, ears, face, neck, head, and other parts of the body.
3. Show how the temporary teeth develop and then the permanent ones. (Use Charts.)
 4. Show the importance of preserving both.
Lay particular emphasis upon the sixth-year molar.
 5. Function.—Tell how the teeth improve with use, and advantage of thorough mastication.
 6. Conclude with general mouth hygiene, as follows:
Articles required:
Brush—Size and shape.
Floss—How to use.
Dentifrice—Warning and advice.
Method of brushing.
Time: Every time the teeth are unclean.
Tell something about the removal of tartar.

OUTLINE OF TWENTY-FIVE MINUTE TALK TO CHILDREN.

1. (For boys.) Show how success in sports and life depends upon good health.
(For girls.) Show how success in singing, reciting, or any public appearance depends upon good health.
Show that good health is impossible without clean mouths and good teeth.
2. Explain the relation of sound, clean, temporary teeth to health.
Explain the relation of sound, clean permanent teeth to strength, endurance, grace, beauty, and class-standing.
3. State briefly how decay is produced and how it extends, using illustrations, if possible.
4. Emphasize the importance of preserving the temporary teeth, and the sixth-year molar.
Introduce phrase, "A clean tooth never decays."
Have children repeat it in unison.
5. Explain the dangers of bolting food, and the advantages to the teeth and body in general of thorough mastication.
6. Conclude with general mouth hygiene, as follows:
Articles required:

Brush—Size and shape, bristles.

Floss—How to use.

Dentifrice—Warning and advice.

Method of brushing.

Time: Every time the teeth are unclean.

OUTLINE OF LECTURE TO NURSES AND PHYSICIANS.

Preface with remarks showing the sphere of preventive medicine, and, as a part of the same, the importance of the oral hygiene crusade, indicating its scope, value and application. Emphasize the necessity of the co-operation of the nurses (and physicians) to bring about its aim.

The following points seem to be the ones that need the most emphasis:

1. Show how unclean mouths are ideal mediums for the proliferation of bacteria. Indicate the following as diseases whose main means of infection is the discharges of the mouth: Tuberculosis, pneumonia influenza, la grippe, diphtheria, measles, mumps, etc. (Quote authorities as per Form 3a.)

Show how lack of, or impairment of, the teeth causes mal-nutrition, mouth-breathing, adenoids.

2. Give brief histology and development of the teeth, temporary and permanent, showing how calcification proceeds, and dietetic influences. (Use Charts.)

Discourage the use of glass tubes for administering drugs; advise capsule or tablet form for all administrations of tinc. of ferric chloride. Emphasize that dilution increases destructive strength of this drug on the tooth structure.

3. Show prevalence and nature of dental caries as a disease itself, and conditions favorable for its inception and increase. Show how reflexly disorders of the eye, ear and brain may result.

4. Give general mouth hygiene for normal conditions indicating:

Articles required:

Brush—Size, shape and bristles.

Floss—How to use.

Dentifrice—Warning and advice.

Method of brushing.

Time: Every time the teeth are unclean.

Mention the formation and removal of tartar.

5. Give the application of the hygiene by nurses, emphasizing:

- (a) The preparation of patients for operations.
 - (b) The care of the mouths during pregnancy.
 - (c) The care of the mouths of children.
 - (d) The care of the mouths of invalids and convalescents.
6. Conclude with the importance of strict oral cleanliness on the part of the nurses as a safeguard against infection for themselves, and those for whom they care.

NOTES FOR USE IN CONJUNCTION WITH LECTURE OUTLINES.

From a hygienic standpoint ,the secretions of the mouth constitute the chief, if not the only, source of respiratory infection.”—*Dr. Wadsworth, of the Medical Commission for the Investigation of Acute Respiratory Diseases, N. Y. Dept. Health.*

“By careful attention to the cleansing of the mouth and the sterilization of food, the alimentary tract may be rendered comparatively sterile.”—*Harvey Cushing, John Hopkins University.*

“Each patient should be furnished with a new tooth-brush and a bottle of antiseptic mouth-wash, and the nurse instructed to cleanse the mouth every two or three hours prior to a surgical operation.”—*Moynahan.*

“Three patients (two men, one woman) died from tuberculosis. In each of these three cases the contributing cause was a decayed or impacted third molar tooth.”—*M. Dubois, Chief of Clinics at the Ecole Odonto-Technique, Paris, France. From “Revue Generale de l’Art Dentaire.”*

“Severe case of tonsilar inflammation is caused by the focus of infection in the mucous membrane near a decayed third molar tooth. Also persistent throat inflammation and tonsilitis is caused by the infection from decayed or diseased teeth.”—*F. LeMaire, Paris, France, in the “L’Odontologue.”*

“Many cases of chronic lacuna tonsilitis have arisen from, and are continued by, if not originated by diseased conditions of the teeth and gums.”—*By Wyatt Wingrave, M.D., Durham, Eng., in “The London Lancet.”*

“Measles, German measles, chickenpox, whooping-cough, mumps, scarlet fever, or scarlatina, diphtheria, influenza, smallpox, all have for their method of infection either the

discharges of the mouth, nose or particles of the skin, and the most fertile soil, the most prolific breeding-ground, and the best harbor and never-failing spring for the germs of all these diseases are filthy and decayed teeth."—*A. Brown Ritchie, Medical Officer to the Education Committee of the City of Manchester, Eng., in "Allen's Civics and Health."*

"Out of 684 sarcomas in different regions of the body, 309 of these were on either the lower lip, upper lip, tongue, mucous membrane of the soft and hard palate. One very frequent cause of these malignant tumors is the constant irritation of a sharp edge of a decayed tooth."—*Woods Hutchinson, A.M., M.D.*

OUTLINE OF LECTURE TO KINDERGARTEN CHILDREN.

Open talk with either story or demonstration to attract attention, and then proceed with the following:

1. Describe graphically the doorway and vestibule of a house, and the effect on the interior of that house, be it ever so neat and clean, of a dirty entrance, with children passing in.
2. Show the analogy of the mouth as the doorway and vestibule of the body, and the effect on the interior of the body of an unclean mouth, with food passing through and carrying filth into the stomach.

Results: Disease and illness; loss of play and school.

3. Ask how many children washed their faces before coming to school. (Usually unanimous.) Then show the importance of cleaning the "inside of the face," in order to be clean and well.
 4. Very briefly, with a large model, if possible, show the alignment of the teeth. Tell the necessity of keeping them clean to prevent "holes" and pain.
 5. Conclude with simple mouth hygiene, demonstrating with giant toothbrush on a model, and emphasize the frequency of this operation and the use of a dentifrice.
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SYNOPSIS OF PUBLIC LECTURE.

MOUTH HYGIENE.

I take it for granted that all want to live to a good old age.

There are men throughout this country who are trying to prolong life—your life—by *preventing disease*.

It is a significant fact that there were but sixty-one persons who died last year to ever one hundred who died in 1878, thirty-five years ago, a saving of 44,115 lives in this city alone.

To do real damage, disease must enter the body. How do most of the contagious diseases find their way into the system? Through the doorway—the mouth.

It is common knowledge that disease germs can neither thrive nor survive unless unclean conditions exist. How is it in your mouth?

There are three things necessary to sustain life—food, water and air. All of the food, all of the water and part of the air enter the body through the mouth. Hence, the importance of absolute cleanliness at all times.

The most stringent Pure Food Law is useless unless the mouth is clean, as the law does not control the food after it has passed the lips. If allowed to remain in the mouth, food becomes polluted worse than any form of adulteration.

Wherein lies the remedy? In practical mouth hygiene.

HYGIENE.

Clean the mouth oftener and clean better.

Brush the teeth whenever they are unclean, after every meal, if possible; at least, after breakfast and the last thing at night.

The brush should not be too large, and should be slightly curved, as is the arrangement of the teeth. Medium stiff bristles will be found best for most people.

Dentifrice (powder or paste) should not be too gritty.

Dental floss should be carefully used for interspaces.

Remember to brush away from the gums, and that there are inner as well as outer surfaces.

Masticate thoroughly, for, like the muscles, the teeth improve with use.

These rules of mouth hygiene, although simple, are effective. Make them a habit, and increase your immunity to disease.

SOCIETY ANNOUNCEMENTS



PENS AUG. 30TH. 1915

The Panama Pacific Dental Congress.

CHE work of the Committee of Organization of the Panama-Pacific Dental Congress is rapidly assuming definite form, and the entire general plan of the Congress will shortly be announced.

The floor plans of the new Municipal Auditorium, in which the Congress will meet, will be sent to all prospective exhibitors within the next thirty days. The exhibits will be held in the main hall of the Auditorium, a room 190 feet square, affording ample space and light, and from present indications, all of this great area will be fully occupied. It is planned to make these exhibits and their accompanying clinics, one of the great features of the Congress, and they will, aside from the general programme, afford a liberal education to any one interested in modern dentistry.

Space in the auditorium has been reserved for the general sessions of the Congress, and for the meetings of its sections, and also for the dental societies and fraternities which will meet in San Francisco during the Congress.

Three hundred thousand gum stickers bearing the seal and date of the Congress, will shortly be placed in the hands of dental dealers throughout the country, and every dentist who receives goods or letters from them, will in this way be reminded that it is time to prepare for a trip to San Francisco in August of 1915, to attend the Panama-Pacific Dental Congress, and the Panama-Pacific International Exposition.

Canadian Dental Association, 1914 Convention, Winnipeg, May 26th to 29th inclusive.



Portage Avenue, Winnipeg (looking East).

WINNIPEG is an ideal city for the C. D. A. Convention, having ample accommodation in the Industrial Bureau Building for the meetings, clinics and exhibits. Every member of the profession should plan to be in Winnipeg from May 26th to 29th inclusive.

ONTARIO DENTAL SOCIETY MEETING.

CHE O. D. S. Convention was held in Toronto during the week of February 16th, and was a great success. The registration was quite up to the average and keen interest was maintained throughout the entire meeting. The following offices and committees were elected:

Hon. President, Dr. J. B. Willmott.

President, Dr. C. A. Snell, Essex.

Vice-President, Dr. Mark McElhinney, Ottawa.

Secretary, Dr. W. A. Black, Toronto.

Treasurer, Dr. A. W. Ellis, Toronto.

Archivist, Dr. C. A. Kennedy, Toronto.

District Representatives—No. 1, Dr. Maybee, Gananoque; No. 2, Dr. Simpson, Trenton; No. 3, Dr. Rhind, Toronto; No. 4, Dr. Musgrave, Niagara Falls; No. 5, Dr. Hiliard, Berlin; No. 6, Dr. Foster, Guelph; No. 7, Dr. Copeland, St. Marys.

Oral Hygiene Committee—Drs. R. J. Reade, A. D. A. Mason, R. G. McLaughlin, C. E. Pearson, W. C. Trotter.

Programme Committee—Drs. J. A. Bothwell, W. B. Amy, W. E. Willmott, R. D. Thornton, T. W. Dawson, E. W. Paul.

Committee on Research—Drs. A. E. Webster, W. E. Cummer, C. G. Scott, C. A. Corrigan, R. D. Thornton.

Winnipeg Dental Society.

CHE Winnipeg Dental Society held its annual meeting on January 27, 1914, when the following members were elected officers for the coming year:

President, Dr. J. H. Greenfield.

Vice-President, Dr. Lewis Bouch.

Secretary-Treasurer, Dr. A. P. McInnis.

The meeting took the form of a banquet, and the best of good fellowship prevailed. In view of the coming meeting of the Canadian Dental Association all the Winnipeg men are putting their "shoulder to the wheel" in the most enthusiastic way.

Manitoba Dental Association.

AT the biennial meeting of the Manitoba Dental Association held in Winnipeg on the 12th January, 1914, the following were elected to the Board of Directors: Dr. Manly Bowles, Winnipeg; Dr. H. A. Croll, Souris; and Dr. D. P. Stratton, Melita. These with Dr. D. N. Ross, Winnipeg; Dr. M. H. Garvin, Winnipeg, and Dr. J. M. Rogers, Boissevain, compose the Board of Directors. At a subsequent meeting of the Board the following officers were elected for the ensuing two years:

President, Dr. H. A. Croll.

Secretary, Dr. Manly Bowles.

Registrar, Dr. D. P. Stratton.

Treasurer, Dr. M. H. Garvin.

At this meeting Dr. Rogers resigned, having ceased practicing dentistry, and Dr. J. F. Morrison, of Virden, was appointed to fill his position.

Golden Anniversary Illinois State Dental Society

THE Golden Anniversary of the Illinois State Dental Society will be celebrated March 23-26, 1914, by holding an International Dental Clinical Congress at the Hotel LaSalle, Chicago.

International Day, Monday, March 23rd.—Table clinics both morning and afternoon. Literary session in the evening. The names of ten distinguished clinicians from practically every State have been furnished the National Clinic Committee by the secretaries of the various State Associations. The National Clinic Committee, through its Chairman, Dr. J. P. Buckley, is sending invitations throughout the United States to the names selected from the official lists they have received. The foreign and Canadian dentists to whom invitations to clinic are to be sent have already received their formal communications.

Illinois Day, Tuesday, March 24th.—Clinics from nine to one o'clock by Illinois men only. Exhibitors' clinic from two until five o'clock. Literary session in the evening. The committee in charge of Illinois clinics has received from the local Advisory Fiftieth Anniversary Committee a list of component society members from which clinicians are to be selected in such manner that each component society throughout the State will have representation on this clinic list. The clinical demonstrations that will occur on Illinois Day are to take the form of a progressive clinicians' clinic. The following fourteen group clinics have been decided upon: Gold Foil Fillings, Gold Crowns, Crowns, Fixed Bridges, Partial Dentures, Full Dentures, Therapeutics, Surgery, Orthodontia, Anesthetics, and Public Service.

That the details incident to such a comprehensive clinic may be more properly cared for, a local committee of arrangements, consisting of three men, has been put in charge of each group by the Illinois Clinic Committee, of which Dr. D. M. Gallie is chairman. At the present time the necessary correspondence to secure the fifteen to seventeen clinicians needed in each group is being carried on.

Chicago Day, Wednesday, March 25th.—Literary programme from 9.30 to 12 o'clock. Between one hundred and one hundred and fifty Chicago dentists will give clinics in their offices from 1 until 4 o'clock, and it will be so arranged that all who wish to see these men working in their home

environments can do so in comfort, both to themselves and to the clinicians.

A Banquet will be given in the evening, to which ladies are welcome. Tickets two dollars. Efforts are now being made to secure noted public speakers for this affair.

A Literary Programme of Exceptional Character.—The literary programme on Monday evening will be a paper on “Operative Dentistry” by Edwin T. Darby, M.D., D.D.S., Professor of Operative Dentistry, University of Pennsylvania, Philadelphia. On Tuesday evening the history of the Illinois State Dental Society will be presented in two papers. The first, by Dr. Edmund Noyes, Chicago, and the second, by Dr. E. K. Blair, Waverley, Illinois, Dr. A. W. Thornton of the Dental Department of the McGill University, will present a paper Wednesday evening on crown and bridge work, and the discussion will be opened by Dr. W. T. Chamber, of Denver, Col., and Dr. H. E. Friesell, of Pittsburg, Pa.

A large number of Canadians have already agreed to give clinics, and it is to be hoped that a most representative group of Canadians will be present. This meeting promises to establish a real record, and those who attend are sure to have a most profitable time.

The Temple-Pattison Exhibit.

THE “Housewarming Convention” of the Temple-Pattison Company, held for three days following the meeting of the Ontario Dental Society, was thoroughly patronized and much enjoyed by members of the profession. Quite extensive exhibits and clinics were made by a number of dental manufacturers. Added interest was secured by the arrangement of evening sessions devoted to papers and discussion.

PERSONAL PAGE



DR. BRETT ANDERSON and family, of Vancouver, B.C., are spending a pleasant winter vacation at Ocean Park, California.

Dr. Gatewood, of Drs. Gatewood and Spencer, who had the misfortune to break his arm while out shooting, is again back to his practice.

The Canadian Dental Association, to be held in Winnipeg in May, is receiving most favorable consideration by the British Columbia dentists, a number of whom have already planned to be in Winnipeg on the morning of May 26th. It is expected that every Province of the Dominion will be well represented at the convention.

Dr. Steed, of Nelson, B.C., was elected Alderman of that city for the ensuing year.

Dr. McSween, of New Westminster, B.C., has been elected as School Trustee.

The many friends of Dr. Dylie, of Toronto, will be sorry to learn that he has found it necessary to undergo an operation for appendicitis. The sincere wish of ORAL HEALTH is that the operation may be entirely successful, and that Dr. Wylie will be feeling quite himself very soon again.

Seventy Years in Practice.

CHE following letter is self-explanatory of a remarkable man and a remarkable record:—

December, 1913.

Dear Dr. Bethel:

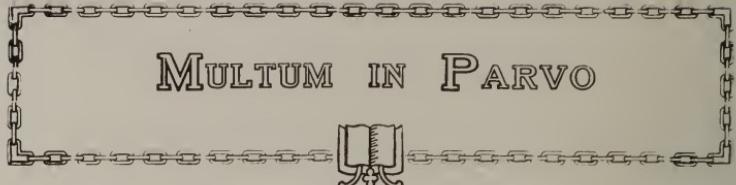
In January I enter my seventieth year of practice, and nearly my eighty-eighth year of age, and can accomplish as much in a day as ever, for the machine is still in good working order. In other words, the old craft is still afloat, timbers sound, no leakage, engines all right, and no prospect of going into dry-dock for repair.

Truly and fraternally,

LOOMIS P. HASKELL,

Chicago, Ill.

—*The Dental Summary*



This Department is Edited by C. A. KENNEDY, D.D.S., 2 College St., Toronto
Librarian, Royal College of Dental Surgeons of Ontario

Helpful Practical Suggestions for publication, sent in by members of the Profession, will be greatly appreciated by this Department.

SOFTENING RUBBER BEFORE PACKING A PLATE.—Copper screening, such as may be obtained in any hardware store, makes the best suport for softening rubber over steaming water while packing flasks.—*C. H. Neill, Dental Digest.*

THE NEED OF OCCLUSAL REST.—In all forms of removable bridge-work or partial dentures, where clasps are used, however, some form of occlusal rest is necessary as a means of providing against subsequent settlement of the case. If this precaution is not observed, complete loss of occlusion and usefulness will soon follow.—*Hart J. Goslee, The Dental Review.*

SEALING WITH GUTTA-PERCHA.—When sealing a treatment with gutta-percha, a pellet of cotton rolled tight and held in the tweezers and pressed against the soft filling will cause the gutta-percha to spread laterally and fill all the cavity, and will not adhere as a hot instrument would.—*Mr. T. Dilkes Page, British Dental Journal.*

SEVENTY PER CENT. ALCOHOL MOST SUITABLE FOR DISINFECTION.—According to Beyer's investigations, alcohol has its greatest disinfecting power at 70 per cent. Absolute alcohol is a less effective disinfectant.—*Cosmos.*

INSTRUMENT FOR INSERTING SILICATE CEMENT FILLINGS.—By burring a hole into the end of a broken excavator and cementing into it a piece of celluloid, a serviceable instrument for inserting silicate cement fillings can be made. The celluloid can be filed to any desired shape.—*Deutsche Zahnärztliche Zeitung.*

RESTORING THE COLOR OF GERMAN SILVER.—German silver which has lost its lustre during manipulation can be brightened up again by heating and dipping in oxalic acid.—*Cosmos.*

A USE FOR EURAFORM PASTE (LILLY).—Occasionally we find a very much inflamed, exposed pulp, especially in the first molar of young children, where eugenol, cocaine or arsenic only seem to increase the pain. Carefully work some of Buckley's Eurafom Paste into the pulp, even though painful for a minute; it will soon subside and be absolutely comfortable inside of five minutes. Leave in two or three days, then apply devitalizing paste.—*H. A. Roan, Xi-Phi Quarterly.*

AN AID IN INSERTING SILICATE FILLINGS.—When inserting silicate fillings, time can be saved while the material is setting by folding the rubber dam over the incisal edges of the teeth, over which it has been placed, and tying it there with floss silk. This will insure the filling being kept dry, and will allow of other work being done in the meantime.—*N. J. Dental Journal.*

A QUICK AND EFFICIENT METHOD OF ADDING ONE OR MORE TEETH TO A VULCANITE PLATE.—While the patient is in the chair, a retention is drilled in the vulcanite, a suitable tooth selected, some wax pressed into the retention, and the tooth placed roughly into position. The wax is then warmed and the plate placed into the mouth. While the wax is still soft the tooth is pressed into position. The whole is syringed with cold water, removed carefully, invested in the usual way, and vulcanized. By this method one saves time, obtains a correct occlusion, and is sure of a good fit.—*E. K. Satchell, Commonwealth Dental Review.*

DISPOSING OF VULCANIZER STEAM.—It is often urged that the vulcanizer should be allowed to cool down gradually, and this advice is good; but it is difficult to follow in the great majority of cases, owing to want of time. An easy method of disposing of the steam is to affix one end of a small length of flexible tubing to the blow-off tap, and to put the other end in a pail of water. The result is no smell, no noise, no steam or moisture blown into the workshop, the vulcanizer is cooled down in a few minutes, and plaster of paris and other stock are saved from the ill effects of dampness.—*A. Ernest, Ash's Monthly.*

ORAL HEALTH.

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Vol. 4

TORONTO, MARCH, 1914.

NO. 3

EDITORIAL.

British Columbia and the Dominion Dental Council.

ON February 7th, 1914, there was introduced in the House Committee of the British Columbia Legislature an amendment to the Dentistry Act, which had in view the curtailment of non-licentiate operators working in an office of a licentiate. It has been possible, under the legal interpretation of the British Columbia Dental Act, for a licentiate dentist to employ a non-licentiate, whose qualifications are frequently open to question. This does not afford the public that measure of protection which was contemplated under the provisions of the Dentistry Act.

In active opposition to this amendment there are a number of the dentists of the larger cities of the province, who, for many years, have taken advantage of the provisions of the Act, and have employed non-licentiates in their practices.

Sheriff Richards, of Victoria, also appeared in opposition to the amendment. It will be remembered that the sheriff's son, a short time ago, sought to compel the B. C. Dental Board, by legal procedure, to grant him a license, he having failed in his Council examination. Dr. Richard's legal action against the Board was ultimately dismissed, with costs.

This suggested amendment has stirred up a great deal of local feeling, and it will be necessary for every dentist in British Columbia to endeavor to look at the whole question in the broadest possible way, and to unselfishly eliminate

every consideration but that of the general public good.

Every dental act rests upon the statutes primarily as a protection to the public, and power is reposed in the hands of a licensing body, not that a close corporation may be established, but for the protection of the public. A Provincial Board, to be true to its trust, must maintain such a professional standard that the highest dental efficiency may prevail. It is equally the duty of a licensing board to supply every proper public demand for sufficient and adequate dental service. If it is found that too few candidates present themselves for examination, the Board should encourage applications that it may not be charged that the Board is selfishly serving the interests of the dentists rather than those of the public.

Because of the rapid development of Canada and the greater demand for dental service, the dental profession will find it very difficult in the next few years to meet the demand of the public for more dentists. This difficulty will automatically adjust itself as time goes on, but in the meantime every provincial Board is liable to be accused of maintaining a "close corporation" and deliberately keeping worthy men out of the ranks of the profession. The only way that this accusation can be fairly met is for the Dental Board of each province to accept, in lieu of its own examination, the certificate of an outside body in which it has confidence, and which maintains a standard equivalent to the provincial standard. There is no better body in Canada for all the provinces to agree upon than the Dominion Dental Council.

A few years ago, if the dentists of British Columbia had admitted graduates with Dominion registration, it might have meant the influx of a number of dentists, who might have, temporarily, somewhat disturbed local conditions. That condition does not exist to-day. Public bodies, in every province of Canada, are asking for dentists. The situation in every province is such that there is absolutely no fear of an influx to any new field, as every man finds ample demand for his services in his present location.

The British Columbia dentists have for some time been "standing on the brink," not knowing whether to take the D. D. C. plunge or not. Why not? This is an oportune time, and British Columbia men may feel assured of a sympathetic response and a warm welcome from the Dominion Dental Council.

Six Additional School Dental Clinics for Toronto.

ON the recommendation of Dr. W. E. Struthers, Chief Medical Inspector, the Board of Education of Toronto has included, in the estimates for 1914, a sum sufficient for equipping six additional School Dental Clinics, and for the salaries of six additional half time operators.

With the four School Dental Clinics established during 1913, the Department of Medical Inspection has now ten of these clinics placed at strategic points to best cover the field. Each of these ten clinics is in operation during the morning of each school day, under the general supervision of a chief of staff.

The addition of these clinics and operators to the Department of Medical Inspection places Toronto in the leading position on the continent as far as dental treatment of school children is concerned.

The attitude of the Chief Medical Inspector, and of many members of the Board of Education is, that as adequate dental treatment for all needy children is essential to the rounding out of the great work of prevention being accomplished by the Department of Medical Inspection, further additions will ultimately be made until the field is satisfactorily covered.

* * * * *

DR. W. E. STRUTHERS, Chief Medical Inspector, has been consistently and persistently behind the School Dental Clinic. As a member of the medical profession his intelligent and whole-hearted advocacy of this phase of the work of his department, has given a great impetus to the whole oral hygiene movement. Dr. Struther's name will always be associated, in the most prominent way, with the placing of oral hygiene in its proper place as one of the most important features of individual and public health.

* * * * *

IN some places members of the dental profession, as members of the Public School Board, have expressed the view that active advocacy, on their part, of dental inspection and treatment of school children would not be looked upon as entirely disinterested.

The members of the dental profession have as high a public motive in this matter as that behind the anti-tuberculosis movement or any other public health crusade. The prevention of tuberculosis is to a considerable extent dependent upon incipient cases or susceptible cases consulting a physician early and at subsequent intervals, and following his advice. We have not heard the physician's disinterestedness questioned in this connection. No right-minded individual can offer anything but commendation upon the advocacy, by members of the dental profession, of the saving of children's teeth and the proper care of their mouths.

Much that has been accomplished in Toronto has been due to Dr. F. J. Conboy. Dr. Conboy has not hesitated to urge this matter upon his fellow members on the Board of Education. His disinterestedness has never been questioned by the Board or by the public. On the contrary his presence on the Board and his deep and active interest in this movement have been largely responsible for the position the Board of Education in Toronto has taken in this matter.

* * * * *

ORAL HEALTH has, on a number of occasions, drawn attention to the fact that there is an urgent need for more dentists. This need is being increased by the School Dental Clinics that are being established in many places.

In Toronto, within a year, sixteen dentists have been taken from private practice for half time, the equivalent of the entire removal from practice of eight dentists.

As the School Dental Clinics increase in numbers, as they undoubtedly will, the withdrawal of many dentists from private practice in this way must have a very appreciable effect upon the ability of the profession to meet the increasing public demand for dental service.

We are convinced that the most vital question that has confronted the profession for years is that of directing into our dental colleges an abundant supply of young men of high ideals, who will not only fill up the ranks of the pro-

fession, but go out with the proper conception of dental practice, as above all things an individual and public health service.

CHE Ottawa Public School Board is about to establish a School Dental Clinic.

IN Chicago the ten School Dental Clinics, for the past two years supported by the generosity of Mr. Rosenwald, have been taken over by the city health department, and will in future be supported by public funds.

OF Toronto's four School Dental Clinics, two were in operation for three months and two for six months during 1913, during which time 556 children received complete dental treatment.

AT the Municipal Dental Clinic, Toronto, during ten months of 1913, a total of 1,218 children received complete dental treatment and 150 partial treatment.

Dental Convention Committees.

CHE local arrangements in connection with dental conventions entail an amount of time and labor seldom realized by the rank and file of a dental society. Officers and committeemen unselfishly spend hours and hours of time in planning a convention. Should the programme not work out perfectly, or fail to suit the popular fancy, criticisms are freely expressed. How many members realize the personal sacrifice that officers and committeemen have made and express their appreciation in personal thanks?

Next time you attend a dental convention don't fail to look up members of the committee and tell them about the many "good things" you have enjoyed.

Oral Hygiene Reports.

Tulsa, Okla.—

Dr. Charles Channing Allen addressed the International Dry-Farming Convention upon "Oral Hygiene," and the important part it must play in preventive medicine. Dr. Allen also made a number of informal addresses before the Women's Section of the Congress on "The Training of Children to a Proper Appreciation of Mouth Cleanliness."

Columbia, S.C.—

The Columbia Dental Society, through its Oral Hygiene Committee, is supplying the press of the State with a series of articles upon different phases of the oral hygiene question. The daily papers are giving these articles very prominent attention, and the Columbia dentists have found the newspaper men ready to co-operate in the work.

Newark, N.J.—

At the meeting of the Central Dental Association of Northern New Jersey, Dr. A. H. Stevenson, of Brooklyn, Chairman of the Oral Hygiene Committee of New York State Dental Society, read a paper on the subject of "Oral Hygiene."

It was strongly urged that oral hygiene should be included in the school studies, and that there should be some compulsory regulation in regard to these matters.

Dr. Stevenson also recommended a thorough training in schools or colleges of young ladies to act as dentists' assistants, and urged such a training that the assistant would be capable of undertaking prophylactic work in the mouth.

British Columbia—

A campaign has been inaugurated by the Vancouver and New Westminster Dental Societies to further oral hygiene in the Public Schools of these cities. The committee has the endorsement of the School Board, and it is planned to have, early in the year a school clinic in full operation. As a temporary arrangement, until a permanent appointment is made, the dentists have offered to give of their time to the clinic a half day each month. Dr. H. T. Minogue is the able Chairman of a very enthusiastic committee.

Utica, N.Y.—

One of the most instructive lectures ever enjoyed by the students of the Utica Free Academy was delivered by Dr. W. A. White, of the New York State Department of Health on the subject of "Oral Hygiene." He was introduced by Dr. Hillis Cole, also of the State Board of Health. Dr. Cole explained that this was one of a series of talks arranged for the benefit of citizens and school children during the annual conference of the Health Commissioners in this city.

Dr. White spoke on "Oral Hygiene." Lantern slides were thrown on the screen to illustrate the lecture. Nearly all slides were photographed directly from nature. The speaker

said that oral hygiene was in his mind a combination of all hygiene, and was perhaps the most important one. Its study should be a part of the school work, he said, and he pointed to Germany as an example. In Germany every pupil's teeth are carefully inspected and the parents notified of the conditions. The poor are given free treatment in the school infirmary. All the children are required to bring their tooth brushes to school and brush their teeth under the direction of the teacher. He commended the work done in Rochester along this line, where four schools are equipped with dental offices under the supervision of a nurse and a doctor. The sign, "A well-conducted free school dental clinic is the best and most effective institution for the prevention of tuberculosis" was then shown on the screen.

Stratford, Ont.—

The Public School Board of Stratford, at its monthly meeting last month, adopted the suggestion of Miss Emily Loney the public school nurse, that toothbrushes be supplied to those children who cannot afford to buy them.

During the last three months Miss Loney has made 3,420 inspections.

St. Louis, Mo.—

The Committee on Papers and Queries, of the Alumni Association of the St. Louis College of Pharmacy, has arranged for a stereopticon lecture on oral hygiene, to be delivered by Dr. John Kennerly at the College of Pharmacy.

Columbia, S.C.

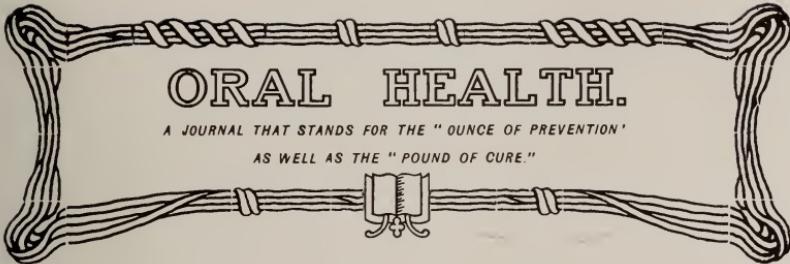
The Columbia Dental Society has arranged with the local press to accept, periodically, articles upon different phases of mouth hygiene. The newspapers have given a two-column space for as many lines as the Society wish to use.

The daily press is one of the most potent influences in the world to-day, and may be used to the greatest advantage by local oral hygiene committees that are willing to prepare the material and subsequently arrange for its publication. This is a most effective, yet impressive, way to reach the masses with the oral hygiene propaganda.

"We live] about forty-four
years in this country when
we ought to live eighty-eight."



Frederick Crosby Brush, D.D.S.
NEW YORK



ORAL HEALTH.

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION"
AS WELL AS THE "POUND OF CURE."

VOL. 4.

TORONTO, APRIL, 1914

No. 4

A Change of Viewpoint.

By FREDERICK CROSBY BRUSH, D.D.S., NEW YORK.

SLOWLY but surely the dental profession is awakening to the necessity of adopting not only better business methods, but also a standard way of determining the amount of the fees to be charged, and feeling the need of a wider knowledge of economics in general, as well.

So far as I know, the first man to publicly urge the dental profession to seek better business methods was Dr. Jack, of Philadelphia, who published a short paper in one of the journals many years ago. I understand that his effort met with so many rebuffs and such severe criticism that it died a-borning. Nothing further of any moment occurred along this line until 1907, when I published the first definite plan of a practical way to determine the cost and adjust the amount of the charge for various dental operations. The rebuffs and censure that were heaped upon me were probably greater than any Dr. Jack received, due, no doubt, to the fact that I was more persistent. I was looked upon as being such a heretic at that time, that many of my professional friends seemed almost afraid to be seen associating with me at dental meetings. Since then the viewpoint of the profession seems to have gradually changed, until now it is not uncommon to see a paper on some business subject announced on the programme of a dental meeting, and many men are writing on the subject.

*Read before the Hamilton Dental Society on the evening of Saturday, 14th February, 1914.

It is a strange twist of the human mind that whenever a new thought on a subject is presented to a man, he at once tries to combat it with all the contrary ideas that he can conjure up. In his endeavor to pick at flaws and find exceptions, he fails to grasp the principle that underlies what is being presented. He occupies pretty much the position of the man who said he had been to the mountains, but did not see the forest because there were so many trees. He never seems to learn that sometimes exceptions, when better understood, tend to prove a principle rather than to confute it. Perhaps the things that I shall say may impress some of you as being new or radical, and it will be quite natural that you should mentally combat them. But I doubt if any of them will be really new; it is more likely that you never happened to think of them in just that way before.

When a dentist sees the necessity of a change in his own business methods, and wonders where to begin, he should realize that the first and most essential thing will be to get a new viewpoint. This is a rather difficult thing to do, but it is necessary if the change is to be made successfully. It will be found difficult, for it is no easy matter to put aside old ideas and habits, and the ways of looking at things that have been the custom for so many years; yet an entirely new train of thought should be established. The whole matter should be looked upon as being entirely impersonal, abstract problem. It will, no doubt, seem like a mighty complex problem at first, but the way to solve such a problem is to analyze it and reduce it to its simplest form. In analyzing a problem of this kind, that most fundamental of all questions—why?—should be kept constantly in mind and applied to every phase of it. There should be a logical reason found for everything that is to be done. Find the truth, and then think about it in a different way from what you have been accustomed to; that is what is meant by getting a new viewpoint.

In applying business methods to a dental practice, it must be understood that while dentistry is a profession in the full sense of the word, it is also, fundamentally, a business, in so far as its operations represent transactions that are made as a means of livelihood and for profit or gain. In this sense, dental operations or transactions are subject to the same primary business rules as would apply to a commercial transaction. If a business is to maintain itself and yield a profit or gain, it is necessary that the cost of conducting the business be known, and a method devised of determining the

proportionate amount of this cost chargeable against each transaction.

Many dentists who are trying to adopt better business methods fail to include in their accounts many items that are legitimate charges against the cost of conducting their practice. The extent of these items will not be known, in an individual case, until the habit is formed of charging up to expenses everything that has to do with the actual carrying on of the practice, together with the cost of anything that has to do with increasing the knowledge and skill of the practitioner. The habit of using one's pocket as a cash draw for the business, and the paying of all personal, as well as office, accounts from a common fund, is largely to blame for the failure to distinguish some of these items. Many men question the necessity of keeping these accounts so distinctively separate, arguing that in the end it all has to do with them personally anyway. Here, again, the viewpoint should be changed.

A problem that puzzles a good many men is: how much to charge up for rent when the office and home are together in a building either rented or owned as a whole. If the building is rented, the office should be charged with a part of the rent, in proportion to the amount of desirable space it occupies. If the dentist owns his home and has his office there, then it will be necessary to estimate the amount that it would bring if rented to someone else, and a proportionate part of this sum charged, according to the space devoted to office purposes. The same method of apportionment will hold true as regards heat, light and water rates. If the general servant is made use of in the care of the office, a part of the wages paid should be charged against office expense. It is not an easy matter to separate these interlocking items at first, but it becomes a simple matter after it is once done.

From a business standpoint, the practice should always be looked upon as an abstract thing, and your relation to it as being in the nature of an employee or manager. This makes obvious the reason for charging up a salary for services against the cost of doing business. It is self-evident that the practice, as an abstract thing, cannot run itself; therefore, it follows that the value of these services of the practitioner is a direct and legitimate charge against the cost of conducting the practice.

Many men fail to take into account their own services

and consider that whatever is left, after paying office rent and the general supply bills, is the profit they have made; whereas, the profits are represented by the surplus that is left after all the expenses of the business are paid—not part of them.

Just how much salary one should charge up is another problem that is hard to solve, and one that has to be looked at from many angles before a decision can be reached. A man is apt to overestimate his own value when it is a question that he is to decide for himself. Not what he thinks he is worth, but how much he can earn, is what should be considered.

In response to a published request for statements of office expenses, a man in Indiana sent in one showing a total of about \$840 for general expenses, and then tacked on an item of \$2,000 which he said he thought he ought to have for salary. This would have been all right except for one thing, which was that his statement went on to show that the largest gross amount of business he had ever done was only about \$1,900. Perhaps his services were worth \$2,000; but where he was going to get it was more than I could see.

Another incident that I recall was the case of an Ohio man. He had been doing a gross business of about \$4,000 a year, and, as so frequently happens, came to the conclusion that he was too big a man to be wasting his time in a country town, and so sought a position as an assistant in a city practice. He figured that as he had been able to do \$4,000 worth of business at home he ought to be worth that much to someone else; so when he was offered a position he asked for a salary of \$80 a week. He was given a week's trial, with the question of salary to be settled at the end of that time. It took only about three days to convince even him that he was not worth more than \$15 a week in a busy city practice, where everything had to run like clockwork. His ways and manners and lack of any real skill as an operator might be passed over in a community where he had grown up with the people; but he was hopelessly out of place anywhere else. Both of these men cut a pattern too wide for their goods.

All things are relative. If a man is so situated that his clientele is made up of people whose income is about \$25 a week, it will be found that the relative cost of maintaining an office and equipment that will satisfy them will correspond. And, generally speaking, the mode of living and the

social requirements demanded of the dentist will likewise correspond. A man with a practice made up of well-to-do, cultured people must maintain a more elaborate establishment and meet greater demands in the way of social entertainment. This being the case, he will need a larger income, and, *having made himself competent*, must make his fees accordingly.

There are several ways of determining this salary question in the beginning. One is to ascertain the average income of the people of a like social standing in the community, and use that amount as a basis to go by. Another is to go over the office accounts for several years and learn the average amount that has been cleared over and above *all* general expenses, and take this sum as the salary to be charged.

When a man realizes that what he has been accustomed to look upon as profit merely represents what is only a fair salary for his services, and that there has been no profit made, in the true sense of the word, he will begin to see more clearly than ever the reason why the business side of the practice needs closer attention, and the question of fees is a pregnant one.

When the amount of the yearly salary needed has been decided upon, things should be so arranged that the salary may be drawn either weekly or monthly, preferably weekly. I know of nothing that will change so quickly the viewpoint of the average dentist toward many of the things that pertain to the business side of a dental practice than this plan of drawing a weekly salary. All business goes in waves, and a dental practice is no exception. There are periods when patients pay their bills promptly, and money is easy; and then again it isn't. The drawing of a definite salary at stated times tends to equalize the fat months with the lean ones, and checks the personal excesses of one period, and relieves the strain of the other. It will also require a closer attention to credits and collections, for if at any time the business has not the funds on hand to meet this salary and other bills promptly, it will be up to you as manager to know the reason why. It will also enable you to regulate your personal and general living expenses to better advantage and to keep them within reasonable bounds. I know of several men who have been started on the road to financial prosperity by changing their viewpoint on this salary question.

It is an excellent plan to keep at least two bank accounts—one for the office and another for personal funds—and to pay all bills by cheque. The habit of carrying around large sums of money loosely in the pocket is a foolish one. While the vulgar display of it may impress some people that you are on Easy Street, it will more than likely lead to wasting of money that you can ill afford. Don't try to impress people that you are one of the most prosperous men in the community, and can afford all of the luxuries that others have, when it may be that your bank is considering the advisability of asking you to withdraw your account because your average balance is not sufficient to make it pay to carry. Such an attitude may make it hard for you to collect your accounts, especially when you find it necessary to press some of them, for the people will think you do not really need the money, and will let you wait to pay for some of their luxuries first. Many a man rides for a fall when he deceives himself regarding his actual resources and tries to keep pace socially with those whose fixed income probably exceeds his by many times. Such self-deception is one of the freakish traits of human nature.

When you are fortunate enough to be able to hear one of the dollars you have saved jingle against some others, don't be foolish and think you are a very clever financier, and try to beat some stock-broker or promoter at his own game. Down in Wall Street the brokers have what they call a sucker list, and it is largely made up of the names of the professional men of the country. When the broker needs a new automobile or a little extra cash, out goes a prospectus telling of the wonderful opportunity to get in on the ground floor of some new enterprise. The ground floor idea is all right, but it always has a lot of suckers for a foundation. It is better to wait and take the chance of getting in through the second-storey window, in case you like the structure after it is up. Don't forget that conservative men are well satisfied when they can find a safe investment at four or five per cent. Speculation in stocks should be left to those who are in a position to watch every move in the game, and can easily afford to lose, and this is not possible for a man whose mind is occupied with professional matters, and whose income depends wholly on what he can earn with his hands.

If there is any class of men who need to study psychology and human nature, and to get a broader viewpoint of things in general, it is certainly the dentists, for their work is so

confining and requires such concentration, that it tends to make them narrow.

Just a word about low fees as a means of getting business. It is human nature to want what is hard to get, and to value a thing by what we have to pay for it, and the man who has established the reputation of being a high-class and a high-priced man is the one who is really sought after by patients who are worth having. Bargain hunters do not make desirable patients.

People who are looking for bargains in dentistry are of two classes: First, the ones who have no means, and must look for that which is cheap (and from the standpoint of a business man you cannot hope to make much out of people who have no money). Second, people temporarily financially embarrassed, who find it necessary to seek cheaper things than formerly.

This latter class will go to a cheap man while financially embarrassed, but the minute their circumstances improve, they will leave this man and go to the higher-priced man. That is human nature.

Those who attempt to establish a practice by fixing a low rate for their services are competing downward, and will drive away good people, who will go to the man who is competing up, by continually endeavoring to render a better service, and who asks a fair fee in return.

Royal College of Dental Surgeons Discipline Committee.

CHE Discipline Committee of the Royal College of Dental Surgeons of Ontario has secured the conviction of a Toronto laboratory man named Small for practising dentistry without a license. Small was fined twenty-five dollars and costs, this being his first offence.

The Royal College of Dental Surgeons is suing all licensees who are in arrears of the annual fee to the college. The college has already secured judgment against three practitioners. The Board is to be commended for its determination to see that every dental practitioner in Ontario is in "good standing," as it is manifestly unfair for a few dentists to be left in arrears while the great bulk of practitioners pay the annual fee.

*A Step Forward in Bridgework.**

The Leger-Dorez System of Split Ferule Crowns and Interlocking Bridges.

JOSEPH NOLIN, D.D.S., MONTREAL, QUEBEC.

MY friend, Dr. Thornton, in a recent paper made an affirmation to which the casual listener might have taken exception when he said that: "Little progress had been accomplished in the technique of crowns and bridge work within the last twenty years." To the close student of modern dentistry, however, nothing could be more to the point and more truthful. Take up the old text books of a quarter of a century ago, such as the American System of Dentistry, and you shall find that, barring a more thorough preparation of abutments, and greater care given to the contact of crowns with their adjoining teeth, the technique of crown and bridgework was then virtually the same as it is to-day.

Soldering, it is true, has been made more scientific; the casting process has contributed its quota of improvements, rendering the use of all porcelain teeth more easy; the reinforced or double backing offers better protection to the porcelain facings; but, nevertheless, we still have the same old bridge, firmly cemented—more or less—to the same over-ground abutments; for the survival of which (the abutments) we still offer the same silent prayer when the same old accidents call for the removal of the bridge.

"Is it not sinful to cut away so much sound enamel and so much sound dentine?" was a question which, in the early days of bridgework, caused many otherwise progressive dentists to hesitate before taking up the innovation. The cutting away of much sound material, the pain and discomfort accompanying the long and tedious operation required for the correct preparation of abutments cause, even to-day, many patients to hesitate before resorting to bridgework, and many others to forego it all together. Of course, clinical experience has given a negative answer to the question referred to above.

*Read before Toronto Dental Society, March 6th, 1914.

Bridgework has proved itself such a useful, such a precious auxiliary for the restoration of impaired masticatory organs, that the tendency of late years has rather been to cut away more and more sound material, as it was gradually found that, by so doing, better results could be obtained.

I am an enthusiast and a teacher of crown and bridgework, and, as such, I fully appreciate the services that bridgework, good bridgework, has rendered to the dental profession and to humanity. Still, can it be said truthfully, that bridgework, in its present shape, is all that could be desired, and that it leaves no room for improvements?

Like all human things it has great qualities and great drawbacks. We overlook the latter in view of the former, thus living up to the old saying, that half a loaf is better than none. It is, however, wise to keep these drawbacks ever present in our minds, if for no other reason than to correct them, gradually, as we advance step by step, towards a better knowledge of the fundamental principles of our profession.

The cutting away of sound material, to the greater discomfort, as stated above, of both patient and operator, is one drawback. The difficulty of removing abutment crowns, when it is found necessary to do so, is another.

These two drawbacks, a clever Frenchman, Dr. Leger-Dorez, of Paris, has tried to overcome, with a measure of success which calls for a better recognition of his work on this side of the Atlantic. He has also endeavored, and successfully so, to construct bridges which would leave to the abutments their natural mobility in the socket, making for a better preservation of the physiological conditions of both root, socket and periodontal ligaments; thus overcoming a third and perhaps more important drawback.

THE SPLIT FERULE.

"It may appear paradoxical," says Dr. Leger-Dorez, "to say that one may girdle intimately a tooth with gold, without having previously ground off the bulging surfaces, and still be able to obtain perfect adherence of the band and perfect adaptation at the neck of the tooth."

"This is however what has been realized after years of patient study. An example may save a lot of explaining:

"If we would bind a tree with a hoop of iron, without cutting off the branches, we must, if the tree is large, use two half-collars of iron or steel bolted together. If the tree

is small we may use a split hoop sprung around the trunk, and securely bolted on one side." It is this principle which has been applied to bridgework and which has proved successful.

The simplest form of the Leger-Dorez bridge (which shall be the only one discussed in this paper) was described by him before the Dental Society of Paris in 1908. The invention was received with varied appreciation. The possibilities of cast work were not then so fully recognized as they are to-day. The theories enunciated were so new, that the inventor's announcement of successful operations in this line of work were received with scepticism by many. As paper followed paper accompanied by models and corroborated clinical applications, the profession had soon to take notice; so much so that to-day dentists from all over Europe flock to Dr. Leger-Dorez's office for further knowledge. The demand for information has been so great in fact that a post-graduate course had to be started in Paris, for the teaching of this particular line of work.

The Leger-Dorez bridge in its simplest form consists of two split bands with tenant extensions, sprung around the abutment teeth; a cast bridge, morticed at both ends; and two locking pins.

TECHNIQUE.

The first operation, in the construction of a split ferule bridge, is the taking of the bite.

This is done by getting the patient to bite correctly in a piece of softened wax which is then chilled and carefully removed.

Secondly, a perfect plaster impression is taken, a model is cast and articulated.

Thirdly, the abutment teeth of the bridge are carefully oiled and covered on all their surface, except the occluding one, with a coating of inlay wax. The wax is brought over the angles of the occluding surface as far only as the occlusion of the antagonizing teeth will allow.

This coating of wax is then carefully shaped and smoothed to an even thickness of about 30 gauge. On the side of the missing teeth, an extension assuming the shape of a cuboid tenant is added.

A platinum-iridium pin is now prepared and slightly tapered. This being oiled and heated, is passed through the centre of the wax tenant bucco-labially.

A vertical incision is now made, with a very thin saw, mesio-distally or vice versa, through the centre of the wax extension and the wax ferule down to the plaster tooth, taking care however not to injure the latter.

Before this operation however the platinum-iridium pin has been removed, leaving a clear hole in the wax extension and is again replaced after the incision. This is to remove any shavings which may obstruct the hole.

If all the above details have been carefully attended to the wax ferule can now be sprung open, removed from the model and invested, the sprue wire being placed at some neutral point. The piece may be cast with coin or platinized gold.

We thus obtain a cast gold split ferule, that should fit almost correctly (more so, in fact, than any soldered ferule could fit) over the abutment tooth.

The surface next to the tooth may then be cleaned and imperfections due to casting accidents, such as air-bubbles and so on, should be carefully corrected. If the contraction of the gold should prevent the two ends of the ferule from coming in perfect contact, when the latter is placed over the tooth, a small piece of 22k gold carefully adjusted and soldered to one side of the gap will easily overcome this accident.

The above technique can evidently not be followed when the abutment teeth is in contact with an adjoining tooth as it would then be impossible to either make, or remove the wax ferule, or to insert a gold ferule in the mouth without first altering the shape of the abutment tooth or its neighbor.

This difficulty is overcome by filing down the contact point of the abutment tooth to the thickness of a 30 gauge piece of gold plate.

A triangular piece of 22k gold, through which three or more holes have been punched, is fitted into place. The holes are filled with wax and the surface next to the tooth is covered with a thin coating of the same material.

This is placed into position in the mouth before taking the impression and can be easily loosened from the model by heating it. Any trace of wax is removed from the plaster model, which is oiled as before. The piece of gold re-coated with wax is placed back into place, forming the approximal side of the ferule, which is completed in wax as heretofore described. The piece of gold should, buccaly and

lingually, overlap the wax ferule so as to become thoroughly imbedded in the investment.

THE BRIDGE.

The cast bands, having been "tried" in the mouth and corrected, are now placed on the model, closed with narrow pliers and locked by inserting the platinum-iridium pin through the hole left in the tenant extension. This hole has been corrected or redrilled if found necessary. The pin should fit correctly in the hole, but not so tightly however as to be difficult of removal.

If the insertion of the pins should not hold the ends of the ferule in perfect contact, a small hole may be perforated through the two parts of the split extension, and these tightly tied together with a silk ligature.

The gold band, the extension and the platinum pins are oiled. Melted inlay wax is poured over the pegs and the extension. A bridge of wax is built across, from one abutment to the other, carved and articulated as any ordinary cast bridge, and chilled. The pins are then withdrawn and the wax body carefully removed, invested and cast.

When porcelain facings are to be used their lingual surface should be oiled, and they should be backed with wax, to a thickness corresponding to the length of the platinum pins (which insures a better adaptation of the wax to the porcelain), the facings removed before investment, and graphite points inserted in the holes left by the pins. The holes left at each end of the wax bridge by the pins may also be filled with graphite, although it will be found that if the holes are perforated through and through and carefully filled with investing material, good results can be obtained, provided the investment is carefully handled while heating, and during the casting operation. The bridge after being cleaned, finished and polished is ready for insertion in the mouth.

ADJUSTMENT AND CORRECTION.

The split ferules are placed in the mouth, pressed home with convenient pliers and the bridge is put into place by slipping the mortice like openings of the bridge over the tenant shaped extension of the abutments. The locking pins are slipped into place and the completed apparatus is examined, the occlusion being carefully revised, and any necessary corrections made. The whole is then ready for the final operation of cementation.

CEMENTATION.

The teeth are cleaned and dried. Soft cement is spread over the inside surface of the ferules and the latter are sprung into their normal position over the abutment teeth. With narrow flat-nosed pliers the two halves of each tenant are firmly but delicately pressed together. Strong silk ligatures which have been previously passed through holes, bored for this purpose through the extensions, are quickly tied and the body of the bridge slipped into place and pressed home. After sufficient time has been allowed for the complete setting of the cement the body of the bridge is removed. The mortice-like depressions at each end of the gingival surface of the bridge and the tenant-shaped extensions of the ferules are covered with a thin coating of cement and the bridge is quickly inserted into place. Before the cement has had time to harden the platinum-iridium pegs are quickly smeared with cement and inserted. The protruding ends of the pegs may now be ground and polished and the operation is completed.

Dr. Leger-Dorez has improved his technique in several ways, since giving out to the dental profession his interesting invention.

He has for instance applied his eye and pin-locking system to the crowning of crownless teeth. His split ferule, he now securely locks into place by means of a screw arrangement, which binds together the two halves of the tenant attachment, making for greater ease in cementation and giving greater security to the ferule.

The tenant attachments he sometimes builds right up to the masticating surface, of which they form a part, allowing the bridge to rotate on the locking pin. This allows the abutments to retain their mesio-distal motion, independently of the bridge.

But that is another story and would call for another paper (perhaps more), and I feel that I have already taken up too much of your precious time.

A resume of the principal advantages of the Leger-Dorez System of Split Ferule Crowns, and Interlocking Bridges would be as follows:

1. The saving of sound tooth material.
2. The saving of pain to the patient and of fatigue and discomfort to both patient and operator.
3. Ease in removing and replacing bridges without in-

jury to either the bridge itself or the abutments.

4. Greater facility in bridging converging teeth or teeth with extra long interlocking cusps.

5. Better restoration of the masticatory functions through allowing the teeth to retain their physiological motion in the sockets.

This application to dental bridgework of sound and simple mechanical devices, known and used by mechanical engineers years and ages ago, is surely a step forward that can not be ignored by the Canadian profession, and for what reason I thought it might be a proper subject to treat before the Toronto Dental Society.

You will be all the more willing to join me, I am sure, in thanking and congratulating Dr. Leger-Dorez for his invention when I say that, differing in this from some other dental inventors he has, from the very start, taken the profession into his confidence; revealing, step by step, through society papers and the French dental reviews, the progress of his discoveries. In failing, moreover, to patent any of his appliances or to place on the market a set of very highly nickeled, very costly and (at times) very useless instruments, he has proven himself to be what is more than a great inventor or a great mechanical genius—a real professional man.

Discussion of Dr. Nolin's Paper.

W. C. TROTTER, D.D.S., TORONTO.

TIS always a pleasure for us to have Dr. Nolin with us, and we especially appreciate this visit in which he has brought us this new message on bridgework. Not having had any practical experience with this particular system and never having seen a case in the mouth I hardly feel in a position to criticize or commend it. Features of this work which may appear objectionable to me now upon its first presentation, might turn out satisfactory after some experience with it in practice, and on the other hand what may now appear to be advantages may not survive the test of time.

Although the methods of attaching bridgework to abutments has not changed very materially in the past twenty

years, the aesthetic effects have certainly improved in that time. However, I quite agree with the essayist that there is still plenty of room for improvement, and no one knows this better than those of us who have had the advantage of many years in active practice, and have been given the opportunity of experiencing our own lamentable failures, to say nothing of those of our confreres which have come under our tender mercies. Speaking generally I may say that I find when I do not cut and prepare the abutments liberally, nay, even heroically, I generally have reason to regret it in later years. I hope this method here described will not tempt us to err in that direction, as it is better to submit the patient to a more trying ordeal in the first place than to court disaster later on.

This system would appear to be particularly adapted to very nervous, timid patients, or to those with hypersensitive teeth. It would also seem to be applicable to bell-shaped teeth and teeth that are tilted. I cannot see how you can get as satisfactory results with it from an aesthetic standpoint. It would seem to be contraindicated in cases where the abutment teeth are short or where the bite is close. The handling of wax as thin as these bands would be would appear to me to present serious difficulties, and the resulting shrinkage during the casting of this alloyed gold would probably cause trouble. I cannot see why the roots of the abutment teeth would have any more freedom of individual movement with this system of bridgework than with any other form of fixed bridgework, and the danger of irritation to the periodontal membrane would certainly not be diminished.

Of course, we should not expect any system to be universally applicable, and if it serves to fill a long felt want for certain special cases, it is well worth our careful consideration and study. Were we only able to adopt this system successfully to 1 per cent. of cases presented, we would be well repaid for learning it, and Dr. Nolin would be well repaid for his missionary expedition to Toronto.

PROTECTING THE PULP UNDER SILICATE CEMENT FILLINGS.

—Although death of the pulp under silicate cement no longer occurs so frequently, it is advisable, in shallow cavities, to introduce a sheet of gold foil into the cavity, adapt it closely by pressing upon it with a piece of spunk or a pellet of cotton, and removing all excess so as to leave the margins free. In deeper cavities, an insulating layer of Gilbert's stopping or Harvard cement or both should be inserted.—*C. Fahsel, Archiv. Feur. Zahnheilkunde.*

The Saliva and Dental Caries.

By RUSSELL W. BUNTING, D.D.Sc., ANN ARBOR, MICH.

CHAT we are to-day but little wiser than the ancients as to the prevention or control of caries, that greatest of dental diseases, should be to us, as a profession, a matter for chagrin. We have busied ourselves in perfecting our technique of replacing tooth tissues which have been destroyed by the ravages of caries, and because of the high state of efficiency which we have attained we have become necessary to the economy of the world and have been given a place among the learned professions. But during this growth of mechanical skill we have made but little progress toward the comprehension of the factors which control or determine the occurrence of caries, nor do we know how these untoward conditions may be rectified. For this we have been criticized by our *confreres* in the medical profession, and others, but when we review the work of scientific men in both dentistry and medicine who have in past times applied to caries every known form of research, and when we consider the investigations which are now being pursued with earnestness and zeal, we feel that we have demonstrated the magnitude of the problem, and have shown our good faith in the pursuit of its solution.

MEDICAL PROBLEMS UNSOLVED.

And although medicine, our elder sister, has solved many of her difficult problems after long and continued effort, she still has remaining to-day many unsolved questions which are of as much import to her and to the world as is that of caries to us. The cause and control of cancer is to-day as unknown as ever. True, there are theories and practises which seem to fit some specific cases, but the prophylaxis and certain cure of malignant growths is far from being attained. And well may we take courage in the pursuit of our great problems when we consider the long and fruitless search which medical men have made to stem that scourge of humanity—the “great white plague.” Can it be possible that their quest shall be consummated in that “mock-turtle

(Read before the Pennsylvania State Dental Society, at its annual meeting, Philadelphia, June 24, 1913, and published in *Dental Cosmos*.)

soup," which so lately has been purchased for \$125,000 and stock?

But to return to dentistry, our admission that we have not as yet attained the object of our scientific search, and have no world-startling results to announce, is not saying that we are standing still. We are progressing, for the work of every man, that has been carefully done, has advanced the sum of our knowledge, and has given added impetus to all others who are engaged in the study of the problem. So that to-day, when there is perhaps more interest in this subject than ever before, we are making great strides, which must surely bring us to a fuller understanding of this great question. Much benefit may be obtained by the comparison of ideas for the purpose of criticism and correlation, and nowhere can this be done so well as before an interested and intelligent audience such as is gathered here to-day. This, then, is a clearing-house of ideas, and I present to you gentlemen my note, even though it may be returned to me as "protested."

PRESENT KNOWLEDGE OF DENTAL CARIES.

It is to Miller, Black, and Williams that we owe our knowledge of the *modus operandi* of the carious process. They have determined for us that bacteria are the active agents, which bacteria are the common mouth varieties, having the property of producing acid when acting upon carbohydrates; this acid, when confined against the tooth, destroys the enamel by simple decalcification, and in this manner the process of caries is inaugurated. These results stand to-day uncontested, and are generally accepted as the true explanation of the process, but when we carry the proposition still farther, and ask why one tooth, or one set of teeth, should be subject to caries while another is not, we unfortunately have no such definite information. It is, then, this search for the variable factors which determine the immunity or susceptibility of the teeth to caries that is engaging the attention of the investigators of to-day.

You will remember that at first the strength and inherent resistance of the teeth was looked upon as a criterion of susceptibility. When Dr. Black published, as the result of his researches, that in his opinion the hardness or softness of a tooth had nothing whatever to do with its susceptibility to caries, he brought down a storm of protest from clinical men the world over, but as nothing has appeared which invalidates his statements, they still stand as they were written. And it is pretty well considered that although it

may be possible for the structure of the tooth to enter into the question to a certain extent, it is not looked upon as being responsible for the sudden and obscure changes in susceptibility, except by those few believers in the mutability of the tooth in response to general physiological change. So that investigation to-day is being focused upon the environment of the tooth, the saliva, ingested food, etc., seeking in them the changeable element which determines caries.

SALIVARY ANALYSIS.

And confined to the saliva, as we are, for the pursuance of our investigations, we are given a very severe handicap, for we are dealing with a secretion about which there is less known than of almost any body constituent. As we search through the medical and chemical literature we find little or nothing upon the saliva, and no help may be had from these sources. Then, when we essay to make our own investigations, we find that we have to deal with an unstable and changeable fluid that seems to resist our endeavors at every turn. It is not like the urine, which has gone through the furnaces of the body and been burned to residues that are stable and comprehensible, but it is rather the mixture of three different secretions, each of which is a living and changeable fluid manufactured by the body to be a part of the digestive process. So that we are dealing not with a chemical or physical problem alone, but one that is biochemical in its nature, and which multiplies our difficulties. In addition to these properties of the saliva we have to deal also with a great multiplicity of constituents which may be continuously or occasionally present, some of which may interfere with reactions which we may wish to use. Whenever a chemist is asked whether a given chemical reaction will take place, his query is always, "In the presence of what?" And there's the rub, for who can say that he knows all the materials with which he is dealing in any given saliva? So serious is this interference in chemical reactions that it is truly impossible to say with certainty that even the simplest of reactions which we employ are trustworthy.

UNRELIABILITY OF INDICATORS.

This has been called to my attention with great force in the past few months in regard to that basic test which we make upon all salivas to determine their acidity or alkalinity. In much of the work which was done upon the saliva in earlier times litmus was the indicator used, and from the results thus obtained many conclusions were drawn. It was in 1907 that Dr. Kirk first pointed out the fallibility of

the litmus test, in an editorial entitled "The Amphoteric Reaction."** He showed that both the alkaline and acid prophanates of sodium and calcium could be present in the saliva at the same time and not be able to neutralize each other, while still one of these salts by its presence might obscure the reaction of litmus with the other. So that he did not consider the litmus test as trustworthy for the most common acid and alkaline principles normally found in the saliva. He might have added that litmus was useless for the detection of many organic acids—among which is lactic, the acid with which we are so much concerned. And then, too, litmus reacts to CO_2 , that gas which is ever present in fresh salivas, and which would interfere with the titration of other acids and bases; so that all recent observations have been made with some indicator other than litmus.

Of these, the one that has been the most used in biological chemistry, and which has found a very wide acceptance among salivary workers, has been phenolphthalein. This is a valuable indicator which is very sensitive to weak acids, having a sharp end-reaction, and less so to weak bases. Unfortunately for our work it is sensitive to CO_2 , and is seriously interfered with by the presence of ammonia. To overcome these objections Dr. Pickerill, who has done considerable work in the saliva, has made use of methyl-orange as an indicator, but it has the fault of being insensitive to weak acids, and of not having a sharp end-reaction when used in the saliva. Therefore phenol-phthalein is perhaps the most useful salivary indicator which we have at our command, and is the one which has been used in the work reported in this paper.

In the latest scheme for salivary analysis suggested by the Scientific Research Committee of the National Dental Association, it was recommended that phenol-phthalein be used as an indicator and titration be made against NaOH to obtain the total acidity. This obviously would include the CO_2 of the saliva, in which we are not concerned, and which would obscure the real acidity or alkalinity of the sample tested. It has been the custom, when wishing to expel the CO_2 from a sample of saliva, to boil for a varying length of time until in the judgment of the individual the fluid is CO_2 -free. But we must all admit that the moment we bring saliva to a boil we have no longer normal saliva, but a very different compound which has resulted from the

*See *Cosmos* for April, 1907, vol. xlix, p. 404.

boiling. We know that the proteins, which are so prominent in the saliva, are coagulated and tend to precipitation on boiling. Furthermore, many amino-acids are split off from these proteins, having an alkaline reaction to the reagent. The average saliva is acid to phenol-phthalein when fresh, and if boiled, many of them become neutral or alkaline as the CO₂ escapes; but the longer we boil, the more alkaline it gets, and who shall say at just what point we have entirely discharged our CO₂, and where we begin to form alkaline decomposition products?

Another method of discharging the CO₂, and one which has been used entirely by the author of this paper during the past year, is that of passing CO₂-free air through the sample while warming the fluid to not over 50° C. This will discharge all uncombined CO₂ from a saturated solution in from five to ten minutes, and although even this low temperature may break up some loosely combined substances, still its effect is probably less than any other method which would be practicable for our purposes.

I have gone to some considerable length to explain the difficulties attending upon the estimation of acids and alkalis in the saliva, and have outlined a method which has much to commend it, and yet I believe that I can point out to you that even this is not a trustworthy test, and does not give us the true value of the combining properties of the saliva. I first noticed this fact when I added various acids to salivas which were originally acid, neutral, and alkaline, and invariably I found that in any case a considerable quantity of the acid had combined with the saliva, so that the resultant acidity of saliva and added acid was much less than the combined acid readings of each. I found that this property varied greatly in different salivas, some taking up much more than others. In a given sample the combining action varied with the amount of saliva used, in a direct proportion. It was not, however, dependent upon the concentration of the solids of the saliva, for when centrifugated the thin portion was as active as the thick. When 1 cc. of water containing 8.1 mgm. of lactic acid was put in 4 cc. samples of various salivas, it was found that the salivas had taken up from 30 per cent. to 63 per cent. of the lactic acid introduced. Somewhat similar results were obtained by using HCl with saliva. This property is not confined to saliva, but may be seen to a less extent in egg albumin. If, however, the saliva be dialyzed, it loses its property of com-

bining with acids. As a check upon my results I made use of dimethyl-amido-azobenzene—which is extremely sensitive to small amounts of HCl. I found that I could add from 1 mgm. to 3mgm. of HCl to 1 cc. of saliva before the indicator would detect its presence.

From this we see that the saliva has an alkalinity which is hidden to phenol-phthalein, and which is able to combine with acids introduced into it from without. Two possibilities suggest themselves to us: One that it is a weak basic salt to which phenol-phthalein is insensitive but which is indicated in all salivas by methyl-orange, and which is in loose combination—as shown by its disappearance in dialysis; the other that it is an amino-acid product of the proteins present. The second of these possibilities is in accord with what has been written in chemical literature concerning the absorption of chemicals by proteins. So that, one or both of these possibilities being true, we must admit that our present indicators when used in the saliva have a large margin of error, a correction of which should be made, if possible. It may be that we shall be forced to make use of electrolytic methods of determining the H and OH ions, but to whatever extent we are forced to go, let us determine on some sane and trustworthy method of making this simple and basic test, in order that our results may be of value. If our future investigations of dental caries are to hinge upon salivary analysis, it is very essential that we establish the fundamental principles of that science at once.

The same difficulties which confront us in the estimation of the acidity and alkalinity of salivas are present to a greater or less extent in the determination of every salivary constituent. The relatively large amount of variable proteins, by virtue of the properties which are characteristic of them, certainly do interfere with the reactions which we attempt to bring about in the saliva, and indeed it seems very possible that these controlling or inhibitive factors which are present in varying degrees in different salivas may have a potent influence in the determination of the course of the carious process in the mouths in which they occur. In correlation to this we have the work done by Dr. Head, in which he has demonstrated the inhibitive action of certain salivas by which they reduce the power of a given acid to produce decalcification. This phenomenon is very aptly stated by Dr. M. L. Ward in a discussion of a paper by Dr. Low. He says: "I firmly believe that it is an innate

characteristic of certain salivas, and of others at certain times, to be as much of a restrainer to the action of many reagents as a good lubricating oil would be." We have, then, before us the problem of first determining the characteristics of a normal, immune saliva, if such exists, and then we must know the respects in which the abnormal and caries-favoring secretion varies from the normal. When we have obtained this knowledge we may in an intelligent manner seek by dietetics and hygiene to correct the fault through the avenues of nutrition. It is greatly to be desired that those men who have contributed so largely to our knowledge of the saliva may continue their labors, and that through the agency of the N. D. A. Scientific Foundation others may be found who are well qualified to pursue these studies until we shall have arrived at a clearer understanding of the fundamental principles of this great question. The foregoing statement is not meant to discredit in any way the results of salivary analyses which have been made, for a great deal of valuable information regarding the process of caries has been attained by the methods which are in vogue to-day, and until further information is obtained we must use the best methods which we have, with a judicious allowance for error in technique.

The investigations which have been made upon dental caries may be summarized under three distinct heads, as follows: (1) The bacteria, and the substances which help or hinder their growth; (2) the food supply of the bacteria, and (3) those forces which tend to protect and confine the bacteria and their products, or, conversely, aid in their dissolution and dissipation.

INFLUENCES AFFECTING BACTERIAL GROWTH.

Under the first class we are reminded of the attempts to kill the active agent in this process and render the mouth aseptic, but it was very quickly recognized that such measures were impractical, and failed of their purpose; for the bacteria are more hardy than the tissues of the mouth, and could we destroy every one, it would be but a short space of time until they would appear again and propagate their species with incredible rapidity. So that the bacteria are always present.

Recognizing this fact, other observers have sought in the saliva some hindering substance which had the property of modifying the action of the bacteria. Notable among these have been the KCNS, the alexins, and other anti-bodies,

which have been given considerable attention. And just recently we have an important contribution from Dr. Percy Howe, in which he claims to have found a more active fermentation in salivas containing a high phosphate content, and less in those having a preponderance of chlorids. The work that has been reported upon these phases of the subject is voluminous, and much of it has been carried out with extreme care; yet the presence of such an inhibitive substance is still but problematical, and its relation to caries has not been established.

THE AUTHOR'S INVESTIGATION OF RATES OF FERMENTATION.

In the investigation of this question I have made a series of experiments which have been continued over the space of two years. In these I sought in both susceptibles and immunes to find salivas which would in their natural state undergo more acid fermentation in a given time, or refuse to form as much as the average, and to correlate these rates of fermentation to the susceptibility of the individual to caries. My method of technique was that of collecting 5 cc. samples of the whole saliva by allowing the patient to expectorate directly into a sterile test tube, and placing this tube immediately into an incubating oven to be maintained at body temperature for 24 hours. At the end of that time the sample was removed and tested for amount of acids formed. From the mass of results which I have acquired I find that all salivas invariably undergo acid fermentation.

TABLE I.—SALIVA AND SALIVA-*plus*-BREAD FERMENTATION.

<i>Immunes :</i>	CASE 1.	CASE 2.	CASE 3.	CASE 4.	CASE 5.	CASE 6.
Normal saliva.....	Al. 0.23	Al. 0.45	Al. 0.45	Ac. 0.20	Ac. 0.10	Al. 0.05
Incubated saliva.....	Ac. 0.20	Neutral.	Ac. 0.30	" 0.30	" 0.44	Ac. 0.40
Incubated saliva plus $\frac{1}{2}$ gm. bread	" 2.75	Ac. 3.80	" 3.00	" 2.78	" 3.40	" 2.45
<i>Susceptibles :</i>	CASE 7.	CASE 8.	CASE 9.	CASE 10.	CASE 11.	CASE 12.
Normal saliva.....	Al. 0.20	Neutral.	Neutral.	Ac. 0.10	Neutral.	Al. 0.15
Incubated saliva.....	Ac. 0.50	Ac. 0.52	Ac. 0.20	" 0.90	Ac. 0.45	Ac. 0.50
Incubated saliva plus $\frac{1}{2}$ gm. bread	" 3.00	" 0.40	" 3.90	" 3.30	" 3.00	" 3.00

Comparison of fermentation between clear saliva and same saliva to which $\frac{1}{2}$ gm. of bread had been added, the reading given as equivalent of NaOH N/100 per cc.

This fermentation begins very early in the time of incubation, and continues to increase up to a certain limit, which is reached in 12 to 24 hours. After this it seems as if it had used up all its available carbohydrate, and the acid production goes no farther. I found also that the amount of acid was variable, some forming twice as much as others, but the amount of acid produced from the natural saliva was so small as to seem inconsiderable in any case, and the variation did not in any way agree with the susceptibility of the patient. Furthermore, I found that if $\frac{1}{2}$ gram of sterile bread was added to the salivas, they all formed from 5 to 10 times as much acid as they did in the clear state. So that these experiments, subject to criticism as they may be, seemed to indicate that the fermentation of the saliva is not so much dependent upon the variation of the bacterial flora, or their life conditions, as it is upon the amount of carbohydrate food present for their consumption.

FOOD SUPPLY AND FERMENTATION.

And this brings us to the second classification, that of foods. Since it is an acid fermentation of carbohydrates which we are considering, it is the carbohydrate foods with which we are concerned. Of these there are two main sources, the ingested foods and those secreted from the salivary and other mouth glands. The mixed diet which is so universal to-day affords an abundance of carbohydrate food, portions of which may be retained in the mouth to give rise to acid fermentation. The amount which shall be retained is determined by the arrangement of the teeth, the thoroughness of mastication, the care of the mouth by the patient, the viscosity of the saliva, and all the forces of oral hygiene. And this in itself constitutes one of the most variable and controllable factors of caries.

Besides the ingested foods, there are two constituents of the oral secretion which have carbohydrate radicals, namely, mucin and glycogen. The first of these was studied by the late Professor Miller, and he reported that the fermentation of pure mucin results in alkaline products, the protein radicals predominating over the carbohydrate. He further stated that the mucin of phlegm secreted from the pharynx, and that of the buccal glands, has a much higher carbohydrate content, and when fermented yields acid. To the buccal mucin he accredited the food source for certain forms of cervical caries. In the light of this, it seems very possible that, under certain morbid conditions, the mucin of the oral

secretions might take on a much more carbohydrate character, and furnish an abundance of food for the propagation of caries independent of other sources.

Dr. Kirk, in a recent series of articles, has been calling our attention to a statement made by the late Dr. Michaels of Paris, that the salivas of many susceptible individuals contained glycogen. Glycogen, as we know, is a product of carbohydrate metabolism, formed in the liver and given to the blood in small and definite percentages. He claimed that in excessive carbohydrate consumption, when the surplus of glycogen formed is being stored in the tissues, it is also secreted in the saliva. Dr. Kirk lays considerable stress upon this fact, and suggests that the salivas of such individuals are more conducive to caries because of the presence of the highly fermentable carbohydrate, glycogen, and upon this hypothesis he bases the opinion that such cases are amenable to dietetic treatment.

COMPARISON OF MUCIN AND BREAD FERMENTATION.

In the study of these two factors I have collected the mucin and solids of the saliva, have thoroughly washed them with distilled water, have reinfected, and incubated. The result was a neutral or but slightly acid solution. I then concentrated the solids of a number of salivas, taken from immune and susceptible individuals, and incubated in sterile tubes. The concentration of these was mucin and solids to liquid, 1:5—or 20 per cent., and the result was an acid several times stronger than would have been formed in the clear saliva; but if I added $\frac{1}{2}$ gram of bread to 5 cc. of the clear solution of the same salivas, there would be formed nearly twice as much acid as resulted from the great excess of mucin. From this we may infer that the solids of the saliva, mucin, glycogen, and other substances, have carbohydrate food to furnish a certain amount of acid, and if continually replenished might be sufficient to carry on the process of caries, but as compared with the ingested foods which remain in the mouth for some considerable time, the salivary solids are inferior in their ability to produce acids.

TABLE II. MUCIN AND BREAD FERMENTATION.

	CASE 1.	CASE 2.	CASE 3.	CASE 4.	CASE 5.	CASE 6.
Saliva, 5 cc }	Ac. 1.80	Ac. 1.45	Ac. 1.60	Ac. 1.10	Ac. 1.25	Ac. 1.55
Mucin, 1 cc. }						
Saliva, 5 cc }	" 2.38	" 2.50	" 2.20	" 1.75	" 2.20	" 3.20
Bread, $\frac{1}{2}$ gm }						

Comparison of fermentation in same salivas between high mucin and solid salivary constituents and small percentages of bread; readings given as equivalent of NaOH N/100 per cc.

INFLUENCE OF PLAQUES.

As we have seen, in the mouths of every individual, whether susceptible or immune, there are the bacteria of caries, and seemingly food enough for their operation, but in one case we have caries of the teeth and in the other we do not. We are all of us perfectly familiar with cases which present mouths that are filthy, in which the fermentations are high, and yet no caries is to be seen. For information as to this class of cases we must look to our third classification of factors, and here we find that our knowledge is very meagre indeed. It is commonly agreed that if caries is to be operative the specific bacteria concerned must be protected from dislodgment, and the acids formed must be confined against the tooth, rather than diluted and dissipated by the saliva. We know very little about the means by which the bacteria are protected and their products concentrated. We do know that, under certain circumstances, some sort of a colloidal substance does act as a protective coating for them, and we have called it by the name of "plaque." The substances of which it is composed have been described as "gelatinous," "gelatin-like," "agglutinous," "mucinous," etc., some believing them to be the products of bacteria, and others regarding them as the products of ingested food. Dr. Kirk suggests that they may be mucin which has been deposited over the bacteria by a simple precipitation from the saliva by the acids of the bacteria. I think we all agree with the statement that these plaques or coverings, call them what we will, are not the same material in all cases. Their component substance may differ, in different individuals, depending upon the nature of the saliva, the character of the foods, and the rate of fermentation. And as the character of their composition may vary, their function may also be changed. If we examine any considerable number of sections of teeth which have been prepared in such a manner as to preserve the plaques, we will see that many teeth have well-defined coverings, but that beneath them there is no indication of decalcification. In these cases it might suggest that the plaques, instead of favoring caries, were a protection to the tooth. Is it not possible that in susceptible individuals there is formed a thin, bland film that acts as a dialyzing membrane to pass soluble foods in to the bacteria, and allows the escape of their waste products, while in the case of immunes, even though the hygiene be poor and plenty of carbohydrates be present, yet the nature of the protecting mass is such as to prevent the growth of the organisms, or

to exclude from them the carbohydrate food?

SUMMARY.

We have seen that the study of dental caries involves many factors and conditions, and that fertile fields for investigation still remain. These will be worked by men who are interested in the problem, and further information will be added from time to time to that which has already been acquired. But it seems worth while to stop occasionally and, in the light of what is known to date, consider how best we may combat caries in the mouths of our patients to-day. As I have tried to point out, the evidence at hand seems to indicate that the two greatest controlling factors in the process of caries are the food supply and the plaques. Granting that this premise is true, we then must reduce, as far as possible, the foods, both ingested and secreted, and must prevent or disturb plaque formation. The time may come when we can intelligently bring about these results through dietetic and metabolic means, but until we know more of the principles involved we are forced to fall back upon our ability to locally produce and maintain a condition of oral hygiene in which the teeth will retain a minimum amount of ingested foods, and all fermentation centres will be broken up.

METHODS OF PREVENTION.

We have in times past made the statement to our patients that "Clean teeth will not decay." And this is perfectly true, but the only way that we can have an absolutely clean tooth is to remove it from the mouth and keep it in a clean place. Cleanliness of the teeth in the mouth is but a relative term, and even though a tooth be polished ever so thoroughly, it is immediately covered and bathed in an infective and acid-producing fluid which may begin at once the early stage of caries. Especially is this true in some mouths, where we see that the greatest care by the patient and operator is not able to prevent the occurrence of caries.

Although oral hygiene is not an absolute panacea for caries, yet there is no doubt that oral hygiene in its true sense is the greatest combating power against the disease which we have at our command at this time. Though it may not produce immunity in all cases, it invariably inhibits the rapidity of caries, and frequently, without any other apparent aid, will entirely prevent it for a number of years. By thorough and effective oral hygiene, the amount of ingested foods remaining in the mouth is decreased to a minimum, the bacteria are periodically disturbed, and their

acids diluted and washed away. And indeed in a very large percentage of individuals this factor alone is able to produce immunity. Oral hygiene is, then, a great and efficient factor, and because of its importance it should be given very careful study and attention by every practitioner of dentistry.

When we speak of oral hygiene we immediately think of prophylaxis, but it is my opinion that, in the average individual, mechanical cleansing is but a feature of the preservation of hygiene in the mouth. Not that I would decry or belittle the value and effectiveness of the prophylactic measures which are now in vogue, for I believe that every patient should be thoroughly drilled in the proper use of the brush and floss silk, and should be enthused to the point where he will be faithful in his mouth toilet. But the point I wish to make is that, in the average individual, prophylaxis of the teeth by the patient is but a periodic and spasmodic process, while there is another factor which is continually in operation, and which if normal is the most potent means of establishing oral hygiene. I refer to the self-cleansing of the mouth.

We have all seen cases in which the mouth was relatively clean and free from deposits of foods, when to our knowledge and by the confession of the patient, the prophylaxis had been very negligently administered. In such mouths the food is finely divided during mastication, and as no favorable points for lodgment are offered, it is washed through the oral cavity and into the digestive tract. In addition to this, every surface of each tooth is scoured and cleansed by the excursions of food over them. This is a fact that is so well known that it is almost trite for me to cite it at this time, but I feel that too few of us are using our knowledge to the extent which we might and should. Too many of us are leaving retention places, improper tooth-forms, and flat fillings which are inimical to oral hygiene. How many of us spend time with every patient to see that the filling restores the tooth to its full original form and gives normal occlusion? How many of us search out every retention spot and make it self-cleansing even at the sacrifice of tooth structure or previously inserted filling? Unless we do make this a conscientious practice our instruction in prophylaxis will be of little avail. A mouth that is not self-cleansing cannot be kept clean with a tooth brush.

Perhaps of all cases it is the approximal cavity that is most sinned against. We have but to look into the mouths

of our patients to see that someone—always the “other fellow”—has neglected to get sufficient separation to restore the approximal space at the gingival. There was then no room to produce a normal contact which would allow the food to traverse the mesial and distal surfaces of the adjacent teeth and cleanse them. And then we see that when he has inserted his filling he has made the occlusal surface, in the molars and bicuspids, just as flat as possible. He may have spent some considerable time in perfecting a high polish, but his result has been a surface which is of little use for grinding, and can only crush the food or hold it while the cusp of the opposing tooth punches holes in it. The operator has forgotten that all-important little marginal ridge which the Great Creator has put on the mesial and distal borders of those teeth to make them effective in mastication. He has thus taken from the tooth a large part of its efficiency, and also has robbed the interproximal space of its greatest protection. So we are prone—yes, I said *we*, for most of us must admit the accusation—we are prone to restore lost tooth substance in a manner that pleases our particular fancy of operative technique, but which has not always a too high regard for tooth restoration, and thereby we are thwarting the greatest inherent protective powers which nature has against caries.

So granting that oral hygiene is so great a factor in the control of dental caries, let us practice it to the best of our knowledge and ability. Let us make every effort to render the mouths of our patients as effective and self-cleansing as possible, and then teach them how to use their dental organs and keep them clean. So may we walk in the light that we have, and look forward to the time when further light will be had that will clear up the dark corners that are now unknown to us!

Tuberculosis in the School Room.

SHOWING NECESSITY FOR CLEAN MOUTHS.

IT is only when such startling reports as the following from the Michigan State Board of Health become current that the Government, Municipal, Provincial and National, become active in dealing with these problems:

“In making a study of the occupational relation to tuberculosis, one cannot help being impressed by the frequent occurrence of tuberculosis among school teachers. A careful study of the following table will give a very comprehensive idea of the situation:

“Over a period of years 52.4% of the deaths among school teachers, between the ages of 25 and 34, were due to tuberculosis, while only 25.8% of the deaths among all persons in Michigan, between the ages of 25 and 34, were due to this disease. Among school teachers of all ages 27.6% of the deaths were due to tuberculosis, while among all persons of all ages only 9.4% were due to this disease.

“This is a matter which should engage the active attention not only of teachers, but of the patrons of the public schools. It would appear from our data that the conditions under which public school teachers labor are conducive to tuberculosis. This is, in a great many instances, an easily established fact. Now this ought not to be. The school teacher, who should be considered as the most valuable factor in the establishment of an efficient citizenship, should not be required to work under conditions which are relatively more conducive to the occurrence of tuberculosis than other professions.

“Extreme precaution should be observed by school commissioners and Boards of Education to prevent teachers who are affected with tuberculosis from continuing in the service. This should be done in the interest of the teacher and in the interest of the pupils. The solution of the situation, however, should not rest simply with the attempt to prevent infected teachers from being employed. The school officials and the patrons of our public schools should be united in an effort to remedy the existing conditions, that

the public school room can in no sense be considered as a place in which one's health is subjected to unfavorable conditions. A more active interest in considering the principles of proper construction, warming, ventilating, and lighting of school buildings will go a great way towards remedying this situation."

If practically three times as many school teachers are dying from tuberculosis in this country as are people in other walks of life, because of the conditions which surround the teachers, *what must be the effect produced upon the school teachers of this country by the various other germs which are just as readily transferred from individual to individual as are the germs which produce tuberculosis? And what must be the influence upon our boys and girls who are compelled by the various governments to attend school from six to twelve years under the same conditions and surrounded by the same influences that surround the teaching profession?*

The above is one of the strongest pleas for teaching mouth hygiene that has been published by the Health Department of any State.

A Case of Acquired Syphilis in an Hereditary Syphilitic with Dental Lesions.

CHE case is a rare one. Miss B., twenty-two years of age, came to have the appearance of her incisors improved, as they were a deformity; the face was entirely altered and reminded one of a person with marked adenoids. Normally the lips were half open, allowing several of the anterior teeth to be seen; the patient had a stupid appearance, was weak-minded, spoke little, and it was with difficulty that she understood what was said to her.

An examination of the mouth showed marked congestion of the soft tissues and hypertrophic gingivitis, the result of large quantities of tartar. Masses of calculi covered the necks of the lower teeth, reaching almost to the apex. Numerous teeth and roots were infected, and the condition of the mouth was deplorable.

The two upper central incisors were typical Hutchinson teeth, each tooth being a flattened ovoid whose lower edge was concave. There was in addition marked narrowing of

the tooth at its free edge. I immediately diagnosed hereditary syphilis, which was confirmed as follows:

On questioning the patient as to how the irregular edge was produced, I learnt that her mother had told her that she had had a fall when young, which fractured the two upper centrals. It is evident that this was not so, for a fall would be most unlikely to produce such a characteristic broken area on the two teeth.

I also learnt that the sister, aged fifteen, presented exactly the same dental deformity.

On examining the remaining upper teeth I noticed that the premolars in particular and the molars to a small extent, were of the hypoplastic type. I also enquired about two other symptoms which gave me the Hutchinson triade and confirmed my diagnosis. The examination was positive; there were eye and ear disorders. This appeared to leave no doubt about the case, but I must add that it would be imprudent to make a general rule. The Hutchinson triade, the corelation of the dental condition of the two sisters, and the hypoplasia—all these characters confirmed the diagnosis, but it might be, and cases are frequent, that these cavities and pits were of tubercular or alcoholic origin, as in degenerates, for example.

The contrary is also to be seen; hereditary syphilis does exist without any sign of the semi-lunar notch; it has simply been observed that these notches are often associated with other symptoms of hereditary syphilis.

Now comes the curious point in my observation; on further questioning I was surprised to learn that she had had an eruption similar to those eruptions which are secondary symptoms of acquired syphilis; they appeared on the trunk and extremities, and were not irritating.

Further examination showed a loss of hair, iritis and general glandular enlargement. These are almost all the symptoms I was able to observe, and they are typical of acquired syphilis.

Supposing for a moment that the patient had not given me the information quoted above, I should have been face to face with a dangerously contagious case. In conclusion, I would point out that an exact diagnosis of hereditary syphilis should not be made in the presence of the so-called Hutchinson symptoms, and that other factors should be sought elsewhere to confirm it.—*La Laboratoire et la Progres Dentaire, Dental Record.*

Open the Window.

CHIS is the season when it is most necessary to preach the cult of the open window. Windows open themselves naturally in the summer. We all sigh then for the cool breeze which the high-flung sash invites. But it is so easy in the winter to leave a window shut and keep out the cold. Yet this is precisely the season when the house air is most dangerous.

A window down at the top is seldom a draught-creator. This is a simple fact which many do not know, but a knowledge of which might lead hosts of timid people into lowering the window. Yet nothing draws off the stale air from a room like a window dropped an inch or two from the top. It is far more effective than a window raised at the bottom. And it is the raised window which floods you with cold air and drives you to quickly shut it up.

Air seems to have little difficulty in getting into a house if you will make room for it. There are chinks at the doors which will let it in once a vacuum is created inside by letting the super-heated and foul air out at the top of a lowered window. The upper openings in a house appear to be hermetically sealed when they are closed; while the lower openings fit loosely. This is why a lowered window will draw plenty of fresh air into a room from elsewhere.

One of the developments of modern dress seems to be to dress for a hot house winter atmosphere; and then to put on very heavy wraps to go out. The effect of this is, of course, that our houses are overheated to keep us warm when we sit inactive, with our outside garments laid off. This is about as bad a thing as we could do for health. We breathe baked air all winter—we keep the windows shut to maintain a high degree of heat—we fear an outside current of air when we are not clad for out-of-doors. It would be far better to follow the English custom of dressing more heavily for the house and weighing ourselves down with few outer garments when we go out.

At all events, keep the window open. It prevents tuberculosis—it alleviates catarrh—it enriches the blood—it enlivens the spirits—it tones up the health—and it puts one in better form to resist the attacks of disease. It is the cheapest health receipt open to universal use. The window should be open more hours than the drug store.—*Montreal Star,*

Teaching of Oral Hygiene Should be Compulsory.

CHE cry for the teaching of oral hygiene in the public schools of many States has been sounding insistently for some time. The public is calling for it, and wherever there has been any medical inspection of the school children the physicians are also asking for help from the dental profession. It may be interesting to give a few figures that will give an idea of the actual conditions existing in the schools of America, says the *Colorado Gazette*.

Out of 500 average school children recently examined by the Board of Physicians of the Board of Health in New York, 400 had some facial malformation which, if it had been taken in time, could have been remedied by simple treatment. Dr. C. Ward Crampton, director of physical training in the Board of Education of New York, who looks after the health of the 700,000 boys and girls in the public schools, says that if New York is typical of school children in the United States, there must be in the schools of the country 12,000,000 children having physical defects, more or less serious, that should receive attention from parents and physicians. There must be 8,988,000 handicapped by bad teeth. Besides these, there are some 7,092,000 suffering from defective breathing, 5,460,000 having enlarged glands, and 1,248,000 suffering from malnutrition as a result of bad teeth. Of these there are 41,600 in New York alone.

This appalling state of things is not so surprising when it is taken into consideration that the estimates are that only 8 per cent. of the people in this country take proper care of their teeth. Dr. Osler said recently that sound teeth were of greater importance to the nation than the restriction of the consumption of alcohol, important as that latter problem is. Dr. William R. Woodbury, neurologist at the Boston Dispensary, says that a neglected mouth is a hotbed for infectious diseases; that it furnishes a fertile soil for infectious germs; that it favors diphtheria, scarlet fever and measles. Even rheumatism, one of the most intractable of all diseases with which physicians have to deal, according to Dr. Gordon Wilson, a prominent physician of Baltimore, arises most often from an infection found in the teeth. In the light of these facts, it seems important to bend all possible energies toward the reformation of these evils and to

apply all possible knowledge and skill for the abbreviation and prevention of so much affliction and disease. The end to be attained seems to be the passage of a law compelling the instruction of pupils in the public schools in oral hygiene.

***Attend the Canadian Convention, Winnipeg,
May 26th to 29th, 1914.***



VIEW OF CITY PARK, WINNIPEG.

CHE programme of the C. D. A. Convention is now receiving the finishing touches. In addition to features previously announced Dr. E. Fay Tinker, of Minneapolis, Minn., will be in attendance and give some very interesting clinics. The Committee on Entertainment announce a banquet at one of Winnipeg's magnificent hotels. Ladies will be present.

Winnipeg men are determined to make this meeting of the Canadian Dental Association a "record breaker" regardless of cost, time, or energy. Have you marked the dates on your appointment book yet? Don't delay making your plans. The time is getting short.

New Jersey State Board of Dental Examiners.

CHE New Jersey State Board of Dental Examiners will hold their regular meeting and examination in the Assembly Chamber of the State House, Trenton, N.J., on June 29th, 30th and July 1st, 1914. Applications must be filed complete at least ten days prior to date set for examination. No interchange of license. License fee, \$25.00.

"All applicants for a license to practise dentistry in New Jersey shall present to said Board a certificate from the Superintendent of Public Instruction showing that before entering a dental college, he or she had obtained an academic education consisting of a four years' course of study in an approved public or private high school, or the equivalent thereof." Therefore, the Secretary will issue application blanks to applicants only upon the presentation of the required dental certificate from the Superintendent of Public Instruction, Trenton, N. J.

A bridge, consisting of three or more teeth (exclusive of abutments) and one Richmond crown (metallic parts in gold), will be required mounted and articulated as a practical test in prosthetic dentistry, in place of a full set of teeth soldered upon a gold or coin silver plate hitherto required.

For further particulars, apply to Alphonso Irwin, D.D.S., Secretary, 425 Cooper Street, Camden, N. J.

The Filling of Canals by Paraffin.

PARAFFIN has recently been recognized as superior to other materials for root-canal fillings. We have already seen that many authors prefer gutta percha to oxychloride, the latter demanding very minute manipulation and its removal is often difficult or impossible.

Gutta percha is, in its turn, capable of reproach for leaving a space between the filling and the walls of the canal, on account of the evaporation of the chloroform from the chloropercha. Paraffin, melted in the canal by means of a coppered point heated by electricity and introduced in a liquid state, appears to fulfil all the conditions required of an ideal substance for canal filling. In itself, it is not anti-

septic, but antiseptics may be impregnated with it. As regards durability, we must wait longer before giving the results of experience.

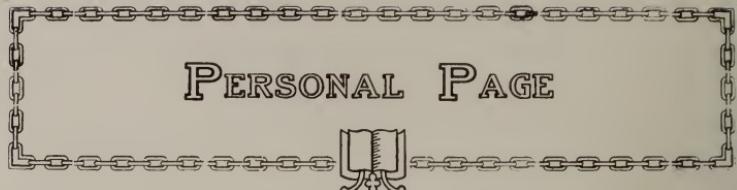
The technique for filling canals with paraffin is as follows: The root, prepared and sterilized, is dried with alcohol and hot air, then warmed electrically with a copper point inserted in the canal and kept there until the patient feels a slight sensation of pain. A paraffin point, similar to a gutta percha one, is now placed in the canal, and the copper point is pushed right through this paraffin to the apex of the root. The paraffin melts at once and follows the conductor to the apex, filling the canal with a warm liquid, which penetrates the first layers of dry dentine. Capillary force enters into the filling process more and more as the diameter of the canal diminishes, bubbles of air are expelled, the wire carefully withdrawn and the paraffin left to harden.—*Archives de Stomatologie in Le Monde Dentaire*.

The Teeth and Cancer.

DR. F. ST. J. STEADMAN, Dental Surgeon and Lecturer on Dental Histology to the National Dental Hospital, has published in pamphlet form a paper which he read before the International Congress of Medicine.

His conclusions are:

- (1) That, apart from the sexual organs, over 86 per cent. of all cancer occurs in the alimentary tract.
 - (2) That long standing chronic inflammation in the sexual organs and in other parts of the body is known to predispose to the development of cancer.
 - (3) That the great majority of persons suffering from cancer in the alimentary canal have advanced pyorrhea alveolaris, which has been present very many years.
 - (4) That this advanced periodontal disease is not nearly so common in persons not suffering from cancer.
 - (5) That it is a well known fact that the constant swallowing of pus can and does, in many cases, bring about chronic gastritis.
 - (6) That the majority of patients suffering from cancer of the stomach have had chronic gastritis for many years prior to the development of the malignant disease.—*The British Dental Journal.*
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PERSONAL PAGE

OFFICIAL announcement has been made of the appointment of Dr. W. M. McGuire, of Waterford, Ontario, to be Registrar of Deeds for the County of Norfolk. Dr. McGuire is the Representative of District No. 5 on the Board of Directors of the Royal College of Dental Surgeons, and has always taken the keenest interest in the affairs of the dental profession. Dr. McGuire will carry into his new work the best wishes and most kindly feelings of the entire profession.

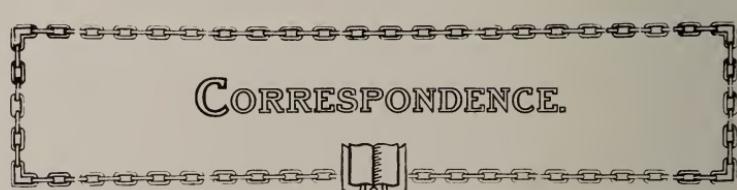
Dr. C. Fitzsimmons, formerly of St. Thomas, has opened an office in Port Stanley.

Dr. J. H. Wiltze has moved his office from Kingsville to Walkerville, Ontario.

Dr. E. A. Clark, of St. Thomas, has taken offices recently occupied by Dr. C. B. Taylor.

Dr. L. D. Hogan, of Walkerville, Ont., recently underwent an operation for appendicitis, which was entirely successful. Dr. Hogan is progressing very favorably.

Dr. Eudore Dubeau, Dean of the Dental Faculty of Laval University, has been appointed by the Provincial Government as member of the Council of Hygiene of the Province of Quebec. This is the first time that a dental surgeon has been called to a seat in the Provincial Council. The honor was justly due to Dr. Dubeau, as he occupies one of the principle positions, from an educational point of view, in the Province, and has also devoted much time to public and dental hygiene.



CORRESPONDENCE.

Sturgeon Falls, Febr. 23rd, 1914.

Dear Doctor Seccombe,—

Since Dr. Kirk's paper came out I have tried to see if his principles apply to my practice, and without definite proof have concluded that both conditions exist, i.e., that

sugar is excreted in the saliva, also that sugar taken into the mouth is a factor in caries in a direct way. I have decided this only from the standpoint of pain.

I have two cases which support Dr. Kirk.

1. Miss ——, age 5, often consulted dentist for toothache, almost lived on candy, large, clean, saucerlike cavities on four distal temporary molars, pulps not involved, always pain after eating candy. Wine test showed trace of sugar and the family physician suggested that it would last for a week after the candies were stopped.

I filled three cavities with copper cement and used the fourth as a test. In three days pain was less and in eight days entirely gone. In a talk with the child's physician I learned that the liver had been storing sugar and therefore it took time to get back to normal. I take this to be proof of the return of sugar to the oral cavity through the oral secretions. Other conditions were the same.

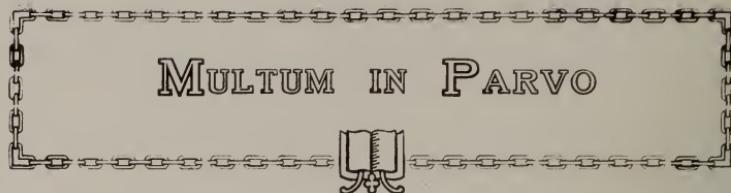
Case 2. Showing susceptibility with sugar. Family of five girls. Every evening their habit has been to make pulling taffy. The third girl has no taste for sugar, has no caries. For each of the others I have filled eight to ten teeth in two years. Other conditions appear the same, so I attribute this susceptibility to caries to be due to sugar, present by secretions and directly.

Another subject—a very old one—the use of cocaine and arsenic in pulp removal. Seems like our politics where one finds a good many "dyed in the wool" partisans. During the recent Ontario Convention I had quite a few discussions on this subject. We should have this question threshed out, and personally I would like to see a real old fashioned debate in the medium of ORAL HEALTH.

If the preceptor did it one way, the student who is now at large, is usually his disciple and argues for his method. I use more arsenic than novocain, and would be glad to have a discussion in the hope that some one would come back with more ideas and we could centralize. We ought to know, and why not make an effort now? When you get through with this the anesthetics should be threshed out. I may say that this will be of more benefit to the slovenly dentist than the student, as it will mean a more exact science. I refer, of course, to the use of these drugs in general and not to the special cases demanding special treatment.

Fraternally yours,

NORMAN DOUGLAS.



This Department is Edited by C. A. KENNEDY, D.D.S., 2 College St., Toronto
Librarian, Royal College of Dental Surgeons of Ontario

*Helpful Practical Suggestions for publication, sent in by members
of the Profession, will be greatly appreciated by this Department.*

REMOVABLE BRIDGES.—With the advent of removable bridges, the possibilities of bridge-work have been greatly increased. In many cases where it would be inexpedient to put a fixed bridge, a perfectly satisfactory and lasting removable bridge may be placed. This is true, for instance, of the lower jaw where all the molars have been lost. These teeth may be restored by the use of removable extension saddles—a restitution not to be thought of by means of fixed bridge-work.—*Burchard and Peeso.*

BLOOD POISONING.—There is great danger attending the use of a local anesthetic on patients who are suffering from pyorrhea alveolaris, since the force required or used during its injection disperses the pus sacs which contaminate the blood and produce toxinemia. Toxinemia may have serious effects; in fact, several cases have been known in which death has supervened.—*H. Cecil Riches.*

To REMOVE STEELE'S FACINGS.—Where a bridge has been removed from the mouth for changes or extensions the facings may be removed in the following manner: Submerge the bridge in a small quantity of sand, place in a receptacle over a Bunsen burner, heat for forty-five minutes, then allow the bridge to cool slowly. This will calcine the cement. If the facings do not slide off readily, place in a pickle of thirty per cent. muriatic acid for fifteen minutes.

THE SETTING OF SILICATE CEMENTS.—A little thought by the operator would prevent some of the foolish things that are done with silicate cements. When a cement begins to set, we know that crystals are forming. If we continue to manipulate it, we break up these crystals so that its strength is reduced, and we are inviting flaws and fractures. It should be placed in the cavity while it is plastic, and be allowed to set under moderate pressure, but without being manipulated meanwhile.

LEAD POISONING.—In chronic lead poisoning (plumbism) a blue line is often found on the margin of the gums round the teeth. Where there are no teeth it is absent. It is due to the deposit in the gum of lead sulphide, the lead circulating in the blood finding its complement of sulphur in the debris stagnant round the teeth. Sometimes inhalation of lead dust or vapours leads to a blue deposit on the gum. This deposit can be removed mechanically. The "lead line" may be an early sign of plumbism.—*J. G. Turner.*

CHURCHILL'S TINCTURE OF IODINE.—Churchill's Tincture of Iodine, used in small quantities about the necks of teeth, is an efficient germicide and astringent before and after pyorrhœa treatment.—*C. H. Clarkson, D.D.S.*

ORAL BACTERIA AND DENTAL CARIES.—H. P. Pickerill and S. T. Champtaloup have studied the organisms present in the mouths of a number of Maori children who were apparently decidedly resistant to dental caries. They found that the organisms were quite as abundant, both in variety and in numbers, as in the mouths of Europeans, who are subject to dental caries. The numbers and types of organisms, therefore, are not at the bottom of the immunity of the Maoris to dental caries.—*British Med. Journal, per N. Y. Med. Journal.*

ALCOHOL AS GERMICIDE.—Alcohol up to 70 per cent. is a good oral germicide and astringent after prophylactic treatment.—*C. H. Clarkson, D.D.S.*

TO CLEAN ARTICLES OF STEEL.—An excellent method of cleaning steel articles which have become rusted or oxidized consists in rubbing the surfaces with pure sweet or olive oil, applying several coats, then laying them aside for several days, after which they are thoroughly rubbed with unslaked lime.—*Popular Mechanics.*

RAPID REPAIR OF PLATES OR BRIDGES BY MEANS OF SYNTHETIC CEMENT.—In case of a necessary rapid repair of a plate or a bridge with non-interchangeable teeth, where appearance is more important than durability, retentions are cut in the plate, or the body of the bridge with a fine bur, leaving the pins undisturbed. In place of the broken tooth, a temporary substitute is built up and modelled in synthetic cement.—*Journal Odontologique.*

ARRESTING HEMORRHAGE FOLLOWING EXTRACTION.—In post-operative bleeding, a tampon of cotton saturated in a five per cent. solution of iodine in chloroform is introduced into the empty alveolus, inducing prompt arrest of the hemorrhage.—*Dental Surgeon.*

Important Announcement.

Dr. Cummer's Post-Graduate Course.

FURTHER details regarding the two weeks course in dental prothesis to be given on or about September 1st under the direction of Dr. W. E. Cummer are to hand. Lectures, amply illustrated by charts, drawings, models, mechanical accessories, etc., will be given covering the examination and preparation of the mouth, and design of prosthetic appliances, choice and manipulation of impression material, anatomical articulation, applied esthetics, theory and practice of use of plaster, vulcanizing and casting as applied to prosthetic dentistry, metal work, economics (including cost keeping), arrangement and equipment of office and laboratory, as well as other subjects which may be decided to be of interest. At least thirty-six clinics will be given, including the following: Greene method of impressions for edentulous cases, anatomical articulation, special impression trays, various casting operations, various interlocking attachments, including Roach and Gilmore, etc., various obturators, stud attachment, removable facings and crowns as applied to prosthetic pieces or removable bridges, staining, altering forms, and artistic arrangement of artificial teeth, interdental splint, simple tinfoil matrix for vulcanite work, bar dentures, upper and lower, various types; cribs, cast and bent wire, swaging devices and difficult models with cores and Hawes' flask, as well as other subjects which may be suggested or thought advisable.

Dr. Cummer will have been using the principles of anatomical articulation as presented by Professor Gysi and the Greene impression technique as presented by Mr. Supplee of New York City and Dr. Greene himself in private practice for over a year and will be in a position to demonstrate these methods in light of that experience. Further details will appear in the next issue of ORAL HEALTH.

ORAL HEALTH.

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Vol. 4

TORONTO, APRIL, 1914.

NO. 4

EDITORIAL.

The International Dental Congress.

THE International Dental Congress to be held in London, England, under the patronage of His Majesty the King in August this year, is likely to be the most important occasion up to now in the history of dentistry.

The dental profession in Great Britain has taken the position that the honor of British dentistry is bound up in the success of the Congress and is organizing its entire membership that each dentist may contribute, not only financially but by his presence and good will, to the success of this meeting. The committee on organization is asking for a guarantee fund of three thousand pounds, of which one thousand has already been subscribed.

The work of the Congress is to be divided into ten sections, each of which will be a notable record of international dental progress and achievement. These sections are as follows:

1. Dental Anatomy, Histology and Physiology.
2. Dental Pathology and Bacteriology.
3. Dental Surgery and Therapeutics.
4. Dental Physics, Chemistry, Radiography and Metallurgy.
5. Dental Prosthesis.
6. Orthodontics.

7. Oral Surgery and Surgical Prostheses.
8. Anesthesia.
9. Oral Hygiene, Public Instruction and Public Dental Service.

10. Dental Education.

It is to be hoped for the honor and standing of dentistry that this Congress may equal in success the great Medical Congress held in London last year.

The British Journal of Dental Science, in speaking editorially of the Congress says:

"Wars, and rumors of wars, Europe an armed camp, the feverish piling up of armaments, social and industrial discontent, religious indifferentism, hideous poverty, and profligate profusion give us all our black hours, when we incline to ask of civilization and Christianity why these things should be, and to cry, 'O Lord! how long?' To turn from the consideration of such gloomy portents, to contemplate the peaceful strife of science, in which all the combatants are allies, and where at International Congresses pitched battles are fought against the common enemy, disease, is to renew our faith in the brotherhood of man and the possibility of the Millennium.

"When the British Dental Association sent to the International Dental Congress at Berlin its invitation to hold the Congress of 1914 in London, it embarked on a great enterprise. It is impossible to foretell the numbers that will be drawn to take part in the proceedings. A modest computation puts the figure at 3,000."

Canadians who find it convenient to attend this Congress will be well repaid in the inspiration the meeting will afford and the world-wide view of dentistry thus obtained.

The Dental Dispensary Record Suspends Publication.

CHE *Dental Dispensary Record* was a bi-monthly magazine, published by the Rochester Dental Society and edited by Dr. William W. Belcher. It began publication four years ago when the agitation for School Dental Clinics had not received much recognition from public bodies. Each year during the four, it was made larger and better, and a perusal of the last copy leaves one with a marked

regret that circumstances have necessitated its discontinuance.

The *Record* was unique among dental journals. It was published by a local dental society and the surplus went toward the support of the Rochester Free Dental Dispensaries, a work carried on in Rochester for the past ten years. Lack of well deserved support has made further publication impossible.

The editor, Dr. Belcher, has, during the years of publication, carried a greater load than most men could bear. Few men have taken as deep or active an interest in mouth hygiene. The *Record* has been carried along and constantly improved, largely by his personal efforts. We feel we are safe in saying that to many men interested in mouth hygiene this publication has been an inspiration. Dr. Belcher is gifted along many lines and is particularly fitted for editorial work. Both the *Record* and its genial editor will be missed from the field of professional journalism.

Oral Hygiene Reports.

Mobile, Ala.—

The president of the College Women's Club spoke on the subject of "Dental Inspection" to the teachers at the Institute here last week and asked for their co-operation in the work. At the request of the club a local dentist gave the teachers an instructive talk on "How to Brush and Care for the Teeth."

The dentists of the city are to be asked to co-operate in this movement. Several have already signified a willingness to make free inspections and to give free work for indigent children.

The city and county health officers, the president of the Mobile Medical Society, the dentists of the city who are members of the State Dental Association, and members of the school board will be asked to meet in a conference with the College Woman's Club to devise plans for successfully carrying on the work. It is a modern work that appeals to the public as another step in the physical and mental improvement of school children, for reports from various cities show that the mental standard, as well as the facial appearance, of their school children has been perceptibly raised where inspection of teeth and free dental clinics have been instituted.

Philadelphia—

Philadelphia looks after the teeth of her school children. She requires that they undergo examination as to the condition of their mouths, unless they have certificates from their own dentists, and then recommendations are made to parents as to what should be done on the mouths of the children so examined. If parents care to attend to having this done at their own expense they may do so, if not there are dentists employed by the city who will do the work free and see that the school children are given the great advantage of good teeth and a mouth that is immune to all disease germs.

The opening of the Philadelphia school term caused renewed activity on the part of Director Neff, of the Department of Health and Charities, toward trying to convince all parents of the supreme necessity for caring for the teeth of children.

Dr. Neff points out that of 98,502 recommendations made to parents during the past school year 40,345 or about 40 per cent. were about decayed or diseased teeth. He states that it is highly important to the health of the child that its teeth and mouth be in good condition. In order to maintain health and to keep up a satisfactory working condition sound teeth and a clean, healthy mouth are a necessity. These protect a child from contracting disease and their absence means that the digestion of the child will be impaired, and impaired digestion is the certain precursor of ill health as it invites diseases of all kinds.

It is the purpose of Director Neff to arouse the interest of all parents to the importance of this matter. Children cannot be expected to appreciate it nor to understand how far reaching are the ramifications of the potentiality for harm in bad teeth and a mouth which is not perfectly healthy. Parents themselves are entirely too indifferent upon this subject and the Director is earnestly trying to stimulate them to do the right thing by their offspring so that the latter may enjoy good health, be able to keep up with the procession in the matter of securing education and be fitted for successful and prosperous lives thereafter. This cannot be done unless all parents co-operate with the efforts which are being made to properly care for the teeth and mouths of all school children and at the expense of the city when parents do not care to assume it.

A GOOD NAME.

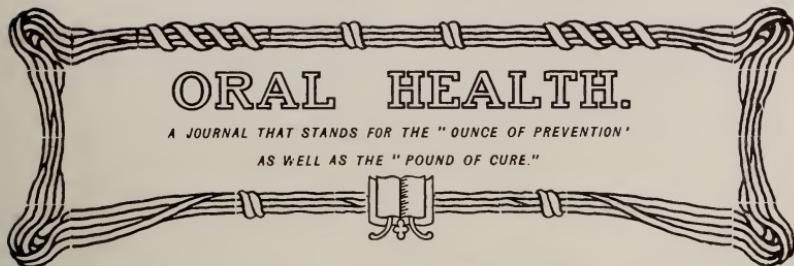
"If your name is to live at all, it is so much more to have it live in people's hearts than only in their brains."—

Holmes



Harold Clark, D.D.S.

TORONTO



VOL. 4.

TORONTO, MAY, 1914

No. 5

*Diet and Dentistry.**

HAROLD CLARK, D.D.S., TORONTO.

WITHIN a few months Sir William Osler has made the statement that the next great thing in the matter of public health is coming from the dentist. Any dentist who has been following closely the findings of the investigators of his profession knows exactly what the great physician meant.

Physical degeneracy and with it, and in consequence of it, mental and moral degeneracy are so common about us we are inclined to take it for granted, as inevitable, like dull days, a backward spring or an open winter—something beyond our control, a dispensation of Providence! It would be a large undertaking to awaken civilization to the fact that this degeneracy, which is the almost exclusive possession of civilized man, is due, very largely, to simple causes, and these causes within our control. This is the great thing in the matter of public health that Sir Wm. Osler referred to, and which I shall try to outline to you to-day.

About twenty-five years ago Professor Miller, an American dentist in Berlin, gave to the world the cause of tooth decay. Up to that time there were various theories that were far from convincing. The most generally accepted claimed that tooth decay was due to acids taken into the mouth with food, the acids dissolving the lime out of the tooth tissue. Miller demonstrated that tooth decay was due to germ life in the mouth. Certain bacteria, commonly found in the mouth, give off lactic acid as a by-product in

*Read before the Ontario Educational Association, Toronto, 15th April, 1914.

their process of life. Lactic acid, held against tooth tissue, will dissolve the lime out of it just as sulphuric acid will dissolve the lime out of a piece of marble.

During all these years since Miller announced his theory and the experiments from which he drew his deductions, he has been accorded the credit of discovering the cause of tooth decay. The cause being bacterial in origin naturally led to a campaign as wide, almost, as civilization to stop the destruction of teeth by the use of antiseptics for the mouth and the general cleaning of the teeth. While this has reduced the ravages of decay enough to make it well worth while, the condition of the teeth of civilized mankind is still nothing less than appalling and is a very deep disappointment to those of the dental profession who had hoped that Miller's discovery would prove a fairly workable solution to the problem. If all members of the civilized human family were similarly afflicted the problem would indeed seem hopeless, but we find some immune who give their teeth no care and others with rampant tooth decay who care for their teeth most faithfully. The mystery is even deepened when we observe, now and then, that the delicate child of a family may be practically immune while the other healthy ones are much afflicted. These facts suggest that there must be some elusive factor or factors which, if discovered, would account for the mystery of immunity and susceptibility to tooth decay. Ever since Miller's time our investigators have been looking for the cause of the cause, as it were; the antecedent to the cause set forth by Miller. To know why the ignorant savage should have practically perfect teeth and the average victim of civilization has bad teeth; to know why the members of the same family even show the extremes of immunity and susceptibility; to know why the delicate person, deprived of exercise, sunlight and fresh air, may have good teeth and his robust and well conditioned neighbor may have poor.

It is only quite recently that new light has been thrown on the subject that promises to remove the veil from the mystery, and while there is yet a large amount of labor for the investigator working out details we seem to have the main facts, and if full use be made of these facts we can probably remove so much of tooth decay of the ills and miseries, the physical and moral degeneracy about us that we should indeed be enthusiastic over the prospect.

It has been demonstrated that where more carbohydrate

food (i.e., starches and sugars) has been eaten than the system can use, a digested surplus, a dissolved carbohydrate, finds its way into the circulation and by way of the salivary glands into the mouth. It is then a substance resembling what is technically known as glycogen. As we shall have frequent occasion to refer to this substance we shall, for convenience, call it glycogen. In observations in our infirmaries it is found that mouths that are immune to tooth decay have little or no glycogen, while mouths that have rampant tooth decay abound with it. Now this carbohydrate substance, glycogen, when taken to the bacteriological laboratory and infected with the germs commonly found in the mouth, proves to be a most fertile culture medium—a good rich soil, as it were. By way of illustration: If we were to put pansy seeds into brickdust we know they would remain good pansy seeds, but they wouldn't grow. If we mix with the brickdust good, rich, moist earth, they begin to grow. Just so with the germs in the mouth. They are relatively harmless in the normal fluids of the mouth; but when they encounter a fertile culture medium in this glycogen they multiply at a rapid rate. The inference is easily drawn. The over-ingestion, i.e., the overeating of carbohydrate food results in the unused portion—the surplus, pouring into the mouth by way of the circulation. This element, added to the normal fluids of the mouth, renders them very fertile in the multiplication of the germs in the mouth. While these germs are few in number, their toxins, or poisons, are so small in quantity as to be negligible, the normal saliva rendering them harmless. As soon as the fertile culture medium, the glycogen, enters the mouth the rapid multiplication of the bacteria changes the whole situation. The increased toxins get the upper hand and do their baneful work unhindered. Undoubtedly, many of the ills that make life miserable get their beginnings right here in this way, but we are considering tooth decay just now and must not wander from our subject.

We have all, probably, studied chemistry enough to understand what happens when we put a drop of sulphuric acid on a piece of polished marble. The lime is dissolved out of the marble, leaving a rough spot where it was polished. Now, the commonest varieties of germ life found in the mouth give off lactic acid as a by-product. If the quantity in the mouth is small the alkaline saliva neutralizes it and renders it harmless, but if the quantity is large it overpowers the alkalinity of the saliva and becomes dominant.

And, right here we must consider a point in digestion which was taught to and understood by teachers in my day and I presume is yet. The saliva contains a digestive ferment, known as ptyalin, whose function is to convert the insoluble starch into a soluble sugar. This ptyalin is unable to perform its function in an acid medium. As soon as the increased amount of lactic acid renders the mouth acid the ptyalin ceases to act and any starchy debris left in the mouth remains unconverted. It is probable that this unconverted starch in the mouth plays an important role in the decay of tooth tissue. It becomes a very adhesive paste clinging to surfaces of the teeth that are remote from the friction of mastication. It contains and nourishes the germs that generate the lactic acid; holds the acid against the tooth, and begins the process of decay. Just as the sulphuric acid dissolved the lime out of the marble, so does the lactic acid dissolve the lime from the teeth. First it dulls the polished surface of the enamel. Soon it becomes rough and the adhesion of the starch is more unyielding. In time it penetrates the tooth tissue until we have a cavity. If this is neglected, the decay progresses toward the vital pulp in the heart or centre of the tooth. When this organ is reached it becomes infected. This results in irritation, inflammation and pain, and now we have ordinary toothache. After a time the increased infection of the pulp results in its death and subsequent putrifaction. The products of putrifaction in time pass out through the openings at the ends of the roots, carrying the infection with them. This sets up irritation and inflammation in the socket of the tooth. The tooth doesn't ache now, but becomes unbearably sore to touch. This condition usually culminates in an abscess. Anyone who has passed through this experience, even with one tooth, will surely agree that Burns was justified in calling it, "The hell of all diseases." If left to itself this abscess follows the line of least resistance, usually out onto the cheek side of the gums. It breaks and empties the contained pus into the mouth. The pain subsides but the abscess rarely heals. It continues to pour pus into the mouth to be swallowed and become responsible for various maladies running the gamut all the way from a vitiated digestion to pernicious anaemia.

Right here, I wish to dwell upon one further point that I regard as of paramount importance. Carbohydrate foods include, as we have already said, starches and sugar. Every time we eat beets, carrots, corn, apples, oranges and many other vegetable foods we get a certain amount of sugar.

Sugar is a substance that exists in the tissues of many plants or vegetables and civilized man has learned how to extract this sugar from the vegetable substances in which it is found, and we have what we may call commercial sugar, and it is a very concentrated carbohydrate. It is as artificial a substance as morphine or strychnine. And just as those substances produce their characteristic impressions on us, so also does sugar; and its specific impression is this: To the average human palate sugar is so attractive that it is eaten away beyond the natural promptings of hunger. We will not only eat sugar, but any food made rich with it away beyond the satisfaction of real hunger. And therein probably lies the real secret of the disaster it is working for civilized humanity. Without it, the mere satisfaction of hunger would, probably, be all the guide necessary to stop us automatically when we had enough. But so much of our carbohydrate food is sweetened with artificial sugar we commonly eat more of it than our system can use, and the bane-ful results already outlined follow. And tooth decay is only one of the maladies made prevalent by the same cause. Before leaving the topic just discussed an illustration may give it point. A hungry man may eat heartily of meat and good vegetables and assure you that he can take no more and then take a good helping and perhaps a second of sweetened rice pudding. If instead of the sweetened pudding he had been offered plain boiled rice, he wouldn't have touched it, proving that the joke about the little boy's definition of a dessert is no joke at all. His definition was: Dessert is what you eat after you have had enough.

Now, I want to draw your attention to at least one further cause of tooth decay and other maladies that accompany it. If it is less significant than the carbohydrate factor in the causation of tooth decay, it is just barely so.

Our civilization has lasted many generations, but the countless generations that preceded it make its period seem "as an hand-breadth," and we find that the endeavor of civilization to change the order of things established throughout so long a period has in many ways resulted in disorder, and, perhaps, in no way is this more striking than in the modification of food.

There are enough aboriginal races in existence to-day, quite unaffected by civilization, to enable us to make studies and draw conclusions as to the conditions of primitive mankind. These conclusions become more interesting and more

convincing when verified by observation of the skulls of prehistoric man.

His vegetable food was of a comparatively fibrous nature. Much cellulose material was mixed with the nutritious. In order to get the nutriment from the food it was necessary for him to subject it to a long and thorough process of mastication. Three results attended this operation. One was a rubbing and cleaning of the teeth with the rough food that was more thorough and effective than any tooth-brush operation. Another was the thorough mixing of the starchy parts with saliva and their consequent digestion by the ptyalin ferment contained. The third result was the inclusion of a considerable amount of the rough, fibrous and non-nutritious portion of the food in what was passed on to the stomach. The action of this was to keep the food open, or porous, as it were, and allow the digestive fruits to readily permeate the mass, and thereby facilitate digestion. The rough character of this fibrous portion of the food serves another useful purpose. Its very roughness rubs and stimulates the walls of the intestinal tract, causing a full and normal flow of the intestinal secretions. This same stimulation causes a vigorous muscular action in the walls of the intestines ensuring the onward movement of their contents. The animal food of primitive man was likewise much tougher than ours—incredible as that may seem!—and demanded much more vigorous mastication. The savage of to-day, if we find him untouched by civilization is usually an ideal for us so far as his physical well-being is concerned. They have neither cows nor goats and when their children are weaned from their mother's breasts they immediately eat food that requires more or less mastication. Before a child is two years old he is equipped with at least four molars. At two years he should have eight molars, an efficient upper and nether millstone! If he is given food that requires to be well masticated the jaws become well developed and large, affording ample room for the new, permanent teeth when they come. The tongue, in the process of mastication, is given heavy exercise and becomes well developed and the new teeth have to arrange themselves in a larger arc or arch to make room for the larger tongue. The child of primitive man had no need of the orthodontist. His teeth found plenty of room awaiting them and arranged themselves in regular order. Compare all this with conditions about us to-day. Long after the child has parted with his mother's milk he is still fed upon cow's milk or food soaked in milk or starchy

food prepared in a semi-fluid condition. For a long time after he has a full equipment of teeth nearly everything he eats is carefully prepared pap. Right here, I am afraid I must take a fall out of my friend the physician, or at least a large number of the profession. His interest in the matter of feeding children seems to commence with the stomach and the mouth merely serves the purpose of a hopper by which the food may reach the stomach. His anxiety that the child's food shall be easily digested is probably responsible for the large amount of soft pappy food prescribed. I frequently have zealous mothers tell me of the great care they take in preparing their little ones' food and I am often convinced that the poor things would be much better with no care at all.

The main points I have been trying to set before you are really new thought—so much so that it is not yet in the text book. There is yet a great deal of work to be done by the investigator and original research man in both the medical and dental professions before we can be dogmatic on many points where conviction is already strong. But there is enough that is proven that we may go ahead confident that we have a new gospel of health which, if lived up to would undoubtedly remove an enormous portion of the misery, the sickness, the degeneracy that is everywhere about us. Of course we must not shut our eyes to human frailties; our disinclination to leave the well accustomed path and blaze for ourselves a new trail, like the roue whose physician advised him to give up wine, women and song if he wished to regain his normal health and well-being. Subsequently he complained to the physician that he wasn't much better, and when asked if he had carried out the advice given him he replied, "Well, I don't sing any more!" All missionary effort must be content with partial success, for a convert to a good cause or principle often becomes a better missionary than the missionary.

In my own practice I have for years enquired into the diet of all patients presenting the extremes of immunity or susceptibility and have learned a great deal thereby. I have observed many with bad teeth, sometimes accompanied by poor health, who have been prevailed upon to adopt a modified and rational diet and be rewarded with a cessation of tooth decay and generally improved health. I have a very strong faith within me that if mothers were taught the principles of a rational diet for their children; and along with this, if the children in the schools were further instructed in

these principles we should have results so gratifying that all the well known benefits of tooth brushing, etc., would seem almost insignificant.

The child whose diet has been wrong and the subsequent effects on the teeth neglected is so appallingly common in the community that it becomes dangerously near being general, especially among the poor. Let us follow such a case. Sugar is cheap, and one one cent piece will buy a lot of cheap candy. It is often the one indulgence a poor parent can give his child. The teeth of course decay; poverty and ignorance deny him the reparative word of the dentist, and soon it is too painful to chew on them. The food is taken into the mouth and moistened with the tongue and swallowed. This is soon followed by indigestion. The poisons from the decayed and putrescent teeth are swallowed and absorbed and are added to the handicap of the indigestion. Lowered vitality follows, and with it susceptibility to every infectious malady that invades the weakened organism, and also with it inability to recuperate. Physical degeneracy is established and soon followed by mental and moral degeneracy. It may seem a long cry from the candy box and the sugar bowl and the slop food to the degenerate described, but to one who has had opportunity to observe they are as surely related as the pull of the trigger and the explosion of the gun.

Let us consider what practical use we may make of all these observations. It seems to me that the broad principles of diet already suggested can be well understood, not only by the physician, the dentist, the teacher and the parent, but even by the intelligent child over ten or twelve years of age. And it was the hope of getting at the mass of children through the teacher that induced me to attempt this paper.

In my practice I explain to my patients, both adults and children, these facts about diet that have bearing on the health of their mouths. For reasons already explained I don't say much about starch, but lay the blame where it most belongs, i.e., on sugar. I tell them that sugar is a good food up to the point that it is all used in the system. If there is any surplus some of it finds its way, after digestion, into the mouth and makes it a fertile incubator for the disease germs that may be there. The germs that cause tooth decay are always there. They only need the fertile soil. Without it they are harmless. I suggest the common sources of sugar; the candy box, the sugar bowl, sugar dissolved in drinks, tea,

coffee, etc., sugar spread on food, such as puddings and other desserts, sugar cooked in foods, such as cakes, pies and pastry of all kinds; jams, jellies, marmalade, honey, syrup, etc. Unless one had a decided distaste for sweet things, the multitude of ways that sugar comes before us makes it hard to escape eating too much unless one understands the principles I have tried to make clear, and adopts a regimen for himself. I also explain to my patients the importance of avoiding food that doesn't require thorough chewing—putting the ban on all such foods as porridge and puddings, soft cakes, etc., recommending in their place crusty bread, rusks, shredded wheat, puffed wheat, triscuits, etc. As a substitute for the starchy deserts that I discourage I recommend the use of fruits. And this brings up a point that shouldn't be omitted in this discussion. It is observed that where a meal is finished with a tart fruit, the salivary glands in a short time are pouring an alkaline saliva into the mouth and this alkalinity will last for hours. Where it is finished with a sweetened starchy food the opposite results. The mouth becomes acid. The theory one would deduce from these facts is obvious. As far as possible terminate meals with fruit. One of our best English authorities uses the expression "That vicious American habit of commencing breakfast with fruit, instead of ending it. If one must commence with fruit, let him also finish with it." The soundness of the theory is well borne out by statistical facts. Sicilians are known to eat quantities of lemons. It is also a fact that they have remarkably good teeth. No less an authority than Prof. J. Sim Wallace says that the people of the fruit growing counties of England, such as Kent have noticeably better teeth than in other parts of the country. It is a significant fact that as one goes north in England and Scotland they get their fruit more and more in the form of jams and marmalade, which, of course, are very rich in sugar.

Statistics show that the teeth of the people of Great Britain are probably the worst in the world. Statistics also show that Great Britain consumes more sugar than any country in the world. Where statistics have been taken of large numbers of working men and school children the number afflicted with tooth decay run up to over 98%. Among certain aboriginal races beyond the pale of civilization the figures are reversed. About 2% show dental decay and 98% immunity.

In closing this paper may I express the hope that it may have proved interesting to those who have heard it, and that it may enlist the co-operation of those who are in a position to test the principles of diet set forth.

Suggestions on the Treatment of Pyorrhea.

W. F. SPIES, D.D.S., NEW YORK.

PO intelligent dentist has any professional right to disregard the evidence of pathological conditions in a patient's gum tissues, or to neglect the application of some intelligent form of treatment for the restoration of those tissues to a condition of health.

Since the real object of the practice of our profession is to prevent disease wherever possible, it is well for us to realize that every case of pyorrhea has a simple beginning and can be prevented by proper treatment at the hands of the dentist and home care by the patient. When the different illustrations of these severe cases are thrown upon the screen, I wish that you would bear this fact in mind, and that a few months or years before, these conditions could have been overcome by comparatively simple treatment.

One of the important points in the treatment of pyorrhea is diagnosis. In fact, diagnosis and treatment are the two practical ends of the study of pyorrhea. In order to arrive at an intelligent diagnosis, a clinical study of pyorrhea should be made. In plain terms, we should know what we are going to do and then do it.

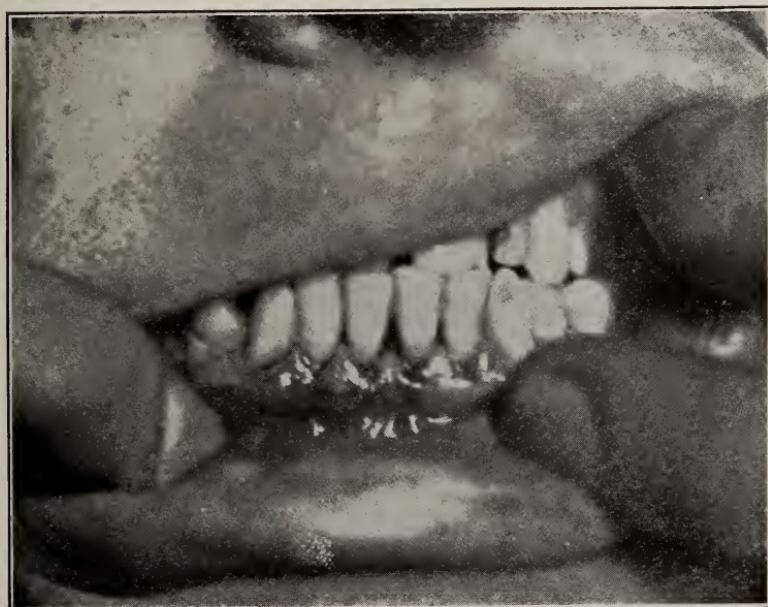
Prognosis is also very important, with reference to communication with patients. Patients may desire, and if so, should receive information regarding the way in which treatment may be expected to end. A certain amount of reserve should always be maintained in your predictions, but at the same time, do not hesitate to tell the patient all that you think it is possible to do, as they often estimate your ability from judgment in this regard.

Some few years ago your essayist had the privilege of contributing a series of articles to dental literature, on the subject of pyorrhea, and this definition was given. Pyorrhea is an inflammation of the tissues surrounding the teeth, and under given conditions this inflammation would follow a certain course to a destructive end, unless proper remedies were applied.

The local causes which produce or help to produce pyorrhea may be summarized under the following heads: Deposits, Mal-occlusion and Mechanical Irritants.

Deposits may be divided into plaques, food debris, salivary and root.

- (a) Plaques produce irritation by fermentation.
- (b) Food debris produces irritation mechanically and by fermentation.
- (c) Salivary deposits produce irritation mechanically and are divided into two kinds: That which collects on the crowns of the teeth above the free margin of the gum, and as it increases in amount impinges upon it. The second variety, called sub-gingival, which collects slightly below the free margin of the gums.



Slide No. 1.—Deposit of salivary calculus beneath the free margin of the gums, with moderate amount of resulting inflammation, no pus present.



Slide No. 2.—In this picture you will note the tissue destruction as a result of salivary deposits, with a moderate amount of pus.



Slide No. 3.—The deposits on the roots of the teeth differ from salivary deposits in amount, in color and in origin.

They may occur in small patches, or in a thin layer which may extend about a considerable portion of the root.

The origin of deposits on the roots is radically different from the origin of salivary deposits. The latter is deposited from saliva and food, while the former results from pathological changes in the tissues surrounding the roots of the teeth. In this illustration you will note the varying amounts of root deposits and bone destruction.

MAL-OCLUSION.

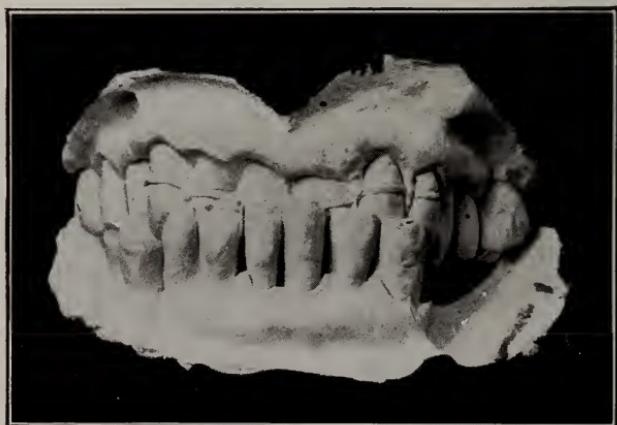
When a tooth is in proper occlusion with the opposing teeth the stress imposed on it is distributed by the occlusal planes and incisal edges that no disturbance of the supporting tissues follows. But the continuance of perverted stress on teeth in mal-occlusion will result in an inflammation of the periodontal membrane in a great many cases. This form of mal-occlusion may be termed "excessive occlusion," and has reference to undue lateral and opposing stress.



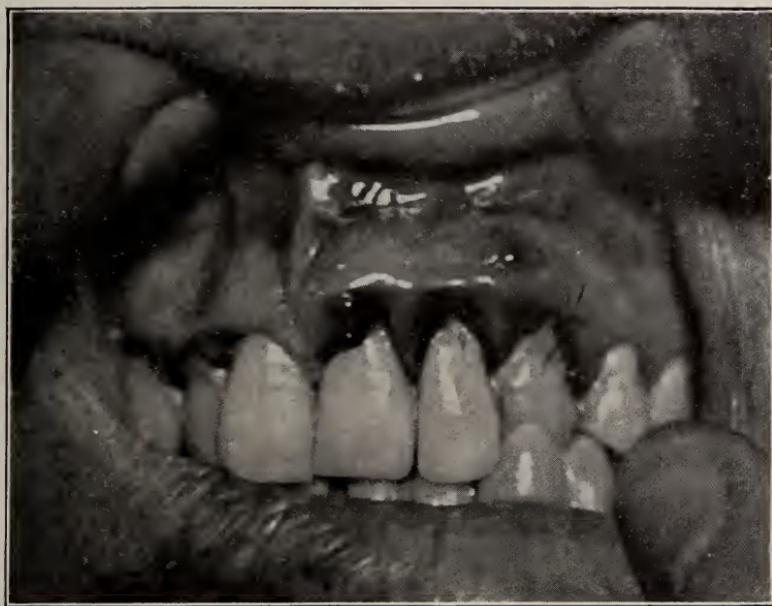
Slide No. 4.—Extensive mal-occlusion, due to irregular eruption, aggravated by extractions. The gum about the upper centrals and laterals was highly inflamed, with fistulous openings above both centrals, and deep pockets. The gum tissue about lower incisors showed marked inflammation. Bony support extensively destroyed; great amount of pus.



Slide No. 5.—The upper cuspid is being driven into further mal-occlusion. The effect of this driving is to inflame the soft tissues about it and to cause the beginning of pocket formation. This is the first stage of pyorrhea. The lower bicuspid exhibited more advanced stages of the same condition.



Slide No. 7.—Extensive mal-occlusion, aggravated by extraction of bicuspid and molars on lower left side, and molars on lower right side. The gum tissue surrounding the upper centrals and laterals was highly inflamed, swollen and of a purplish red color, with extensive pockets and copious flow of pus. The upper centrals and laterals were held by wire splint.



Slide No. 6.—Lingual mal-occlusion of cuspid. Inflammation began about it, became chronic, and extended to involve lateral and central. Extensive destruction of process about cuspid, with fistulous opening; the pulp is vital.



Slide No. 8.—Radiograph showing loss of first molar and destruction of process between the molars. You will note the lack of contact. Nature, in trying to compensate for this injury, allows the upper molar to elongate.

MECHANICAL IRRITANTS.

Under this heading may be classed improper application of ligatures, clamps, matrices and prosthetic dentures. But most important, poorly adapted crowns, bridges and unfinished fillings. By proper restorations, we are able to con-

serve the health of the mouth, while, by neglect of them, conditions more serious than those we undertook to remedy may be induced. Probably one of the most important features of restoring a tooth to usefulness, and one that is frequently overlooked, is proper contact with the adjoining teeth. There are few words in dental literature too strong to express the importance of this contact in the preservation of the interdental tissue and of the tooth itself. When the contact is not properly formed, and the embrasures are narrow, food crowds down into the interdental space, with disastrous results. Also, by lack of proper contact, the tooth cannot withstand the stress of mastication, and evil results follow.



Slide No. 9.—Faulty adaptations of a gold crown to a tooth. The poorly adapted band acted as a persistent irritant to the soft tissues about the root and induced inflammation, which resulted in destruction of the process.



Slide No. 10.—Shows a gold crown and an approximal filling, which was never properly finished. The excess of filling material, crowding on the interdental papilla, caused inflammation, with resulting destruction of process and pus flow.



Slide No. 11.—The picture shows a case where porcelain crowns were placed on the centrals and subjected to excessive occlusion, and inflammation resulted, attended with considerable pain on mastication.

CONSTITUTIONAL INFLUENCE.

There is no doubt that constitutional causes sometimes play an important part in establishing inflammatory conditions of the tissues surrounding the teeth, in conjunction with local causes. Any derangement which lowers the resisting power of the body tissues may act as such a cause. We must not overlook the fact, however, that pyorrhea is often responsible for systemic disturbance, and that each may unfavorably influence the other.

RESULTS OF IRRITATION.

It may matter little which of the irritants already enumerated are present, since the result of any is the beginning of an inflammation which, if allowed to go unchecked, follows a regular course to a destructive end.

There are five well-marked characteristics of inflammation wherever it is found. These are redness, swelling, heat, pain, and altered or loss of function. These are characteristics in varying degrees of that inflammation which we call pyorrhea.



Slide No. 12.—In this illustration we have an advanced case, where the inflammation has become chronic and accompanied by infection and pus flow, and extensive loosening of the teeth. (Illustrations numbers 12 and 13 are of the same case as illustration No. 21.)



Slide No. 13.—This is of the same case as the preceding

illustration. A little later I will show the illustration of the case when treatment was concluded.

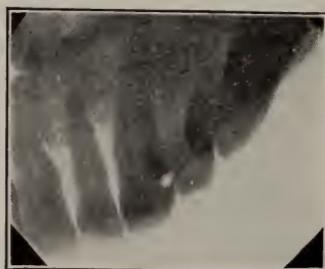
When this inflammation becomes well established, bone destruction takes place, and the teeth become loose. In order that we may better understand why a tooth does become loose, the normal anatomical arrangement for the retention of it should be briefly reviewed.



Slide No. 14.—In this picture, it will be seen that the supporting bony structure between the first and second molars surrounds the tooth nearly up to the enamel or crown line. You will also note the contact of the crowns, which plays no small part in the retention of the teeth, by better enabling the teeth to withstand the stress of mastication.



Slide No. 15.—To those of you who are not accustomed to reading radiographs, I will say that the light areas indicate absence of bony tissues. The dark areas indicate presence of bone. You will note that at least two thirds of the bony support has been lost about the central and lateral, permitting excessive movement of the teeth and preventing the re-establishment of healthy conditions, although quite frequently the inflammation can be held in check by treatment. As a part of treatment, a permanent splint was constructed for this case.

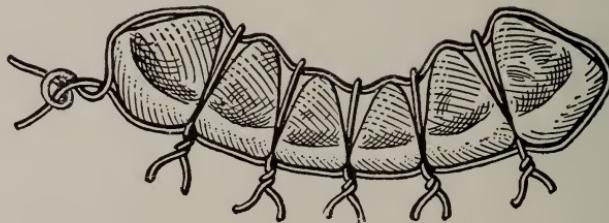


Slide No. 16.—You will note here a loss of two-thirds of bony support about the lateral. By treatment this tooth became firm without the aid of a splint. Such cases are not uncommon.

TREATMENT.

Like all inflammations, in order to restore the tissues to health, we must remove the irritation which produced it, give the tissues rest when necessary, and institute proper treatment during the process of repair.

All overhanging edges of fillings should be smoothed, and poorly adapted bands of crowns removed. If there is excessive occlusion, this should be relieved. When the teeth are extremely loosened, a temporary splint should be used.



Slide No. 17.—This illustration shows one form of a temporary splint, which is made by using either No. 26 gauge platinum wire or ligature wire, No. 26, for large loop, and No. 30 for tie-wires in between the teeth. The slip-noose is first made over the teeth to be included in the splint, by bringing one end of the wire over the other, but not twisting them together. Cut short pieces of wire, to be used between the teeth, and make in the form of a U, allowing the lower wire to be a trifle longer, as this assists in getting the wire between the teeth. After it has been placed between the teeth, the ends are twisted together and drawn tight. After all are placed, they should be cut to such a

length that the ends may be turned back into the interproximal space, without touching the gum tissues. The ends of the wire of the slip-noose should now be twisted together and turned back.

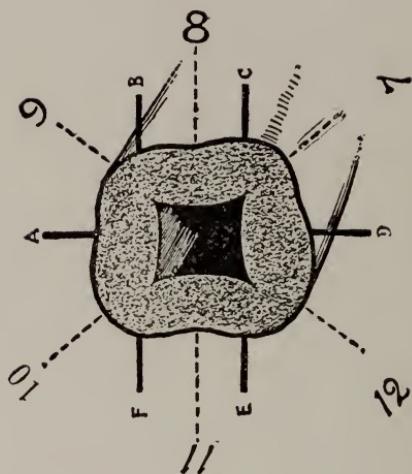
REMOVAL OF DEPOSITS.

Preparatory to removal of deposits, the mouth should be cleansed and the field of operation given particular attention. For the removal of deposits below the free margin of the gum, instruments of special design are necessary, and upon their selection, many times, depends our results.

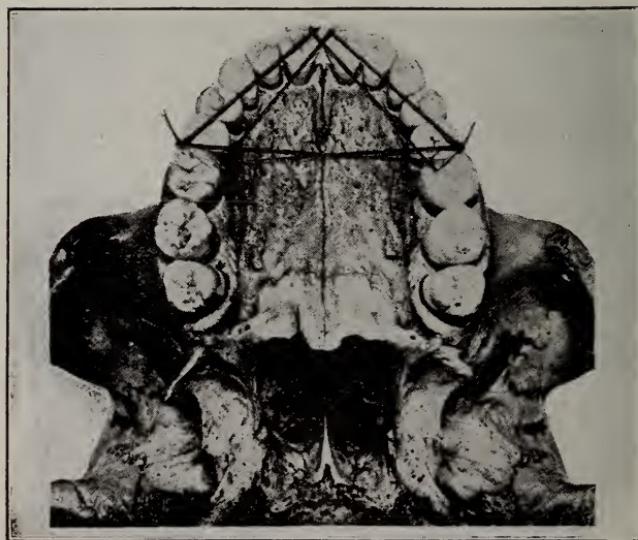
The instrumentation can be accomplished with no greater labor than is expended on other dental operations, and with probably greater resulting satisfaction to both dentist and patient, if proper instruments are used.

The selection of instruments to be used in treating pyorrhea depends somewhat on the operator, but there are a few fundamental facts which must be borne in mind. The instruments for this work should be made thin, but with ample strength at those points where strength is needed. If an instrument is bulky, it is difficult to get it into a pyorrhea pocket; furthermore, bulky instruments are unnecessary. It is of the greatest importance that the angles of the instruments will permit the use of the anterior teeth as a fulcrum, and still afford the operator that range of movement which will enable him to reach all parts of the teeth and remove the deposits. The advantage of being able to use the anterior teeth as a fulcrum will be evident, since it gives the operator a power and confidence he might otherwise lack. The use of a reasonable number of instruments, which correspond with these fundamental requirements, will enable the operator to successfully remove deposits.

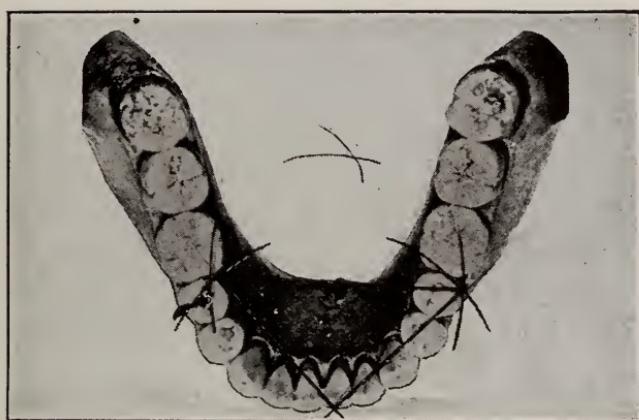
During the instrumentation, the greatest care should be exercised not to lacerate the soft tissues, not only out of consideration of the patient's feelings, but because each laceration opens up new avenues for infection and retards the process of repair. The instruments should be passed alongside the root and in contact with it until the bottom of the pocket is reached. During this use of the instruments, the importance of proper angles between handles and blades is made apparent. With proper angles, the blades will lie alongside the root and plane off the deposits without gouging the root or undue laceration of the soft tissues. With improperly angled instruments both these unfortunate actions will be uncomfortably common.



Slide No. 18.—In this illustration we have a cross-section of a lower right first molar. You will see that it has been divided into sections, indicating the use of six instruments. No. 12 instrument would work approximately from D to E, then to be followed by No. 11, and so on. This insures the use of the full width of the cutting edge and three points of contact.



Slide No. 19



Slide No. 19.—This illustration was taken from Winter's book on Exodontia, and illustrates that the instruments are interchangeable.

Having secured the proper instruments, you will do well to give them proper care. The first step in this care is to keep them sharp. The cutting edges should be kept sharp by frequent attention rather than neglected until no semblance of a cutting edge remains. This maintenance of sharp edges is the first requisite of humanitarian work. It also rewards the operator by enabling him to do more and better work in a given length of time.

MEDICINAL ASSISTANCE.

It is our intention to bring about a healthy condition in the gum tissue when affected by pyorrhea, and in this we receive aid by the application of medicinal agents, indicated for the treatment of this particular disease. We must correct a disordered circulation and prevent further infection.

We need stimulation to awaken the active qualities in the tissue cells to eliminate its waste products, and to make proper use of the materials which the circulation brings to it. We need antiseptic qualities in order to prevent further and deeper infection, during the negative phase in the healing of the tissues.

It must be remembered that medicinal agents can in no case create new functions in a cell or tissue; but they can modify existing functions or make evident functions which have been latent. It is the intention of "Nature" to bring the tissue affected by disease back to a normal condition, but it is the task of the dentist, when treating pyorrhea, to direct his treatment in such a manner as to remove obstacles

from nature's path. As has been said, "the surgeon cannot cause the union of a broken bone; but he can put it in a most favorable condition for nature to perform this union."

The experience of many practitioners over a period of several years amply confirms my personal conclusion that a combination of Cresol (refined), oil eucalyptus, oil birch, oil sassafras, oil camphor, oil turpentine, oil capsicum, alcohol and ether, known as dentinol, presents medicinal aid which meets the requirements in treating pyorrhea. Time will not permit of a consideration in detail of all its ingredients. But I will briefly explain about Cresol and oil turpentine.

For comparative purposes, let me briefly recall to your mind the formula of phenol— C_6H_5OH . It is needless for me to explain its action and uses. Cresol has a formula $C_6H_4CH_3OH$. You will note that an atom of hydrogen in phenol has been submitted in Cresol by the CH_3 group. By this substitution, according to Sollmon, the antiseptic properties of Cresol are increased three times over phenol. He says further that the ideal antiseptic has not been found, and probably does not exist, but Cresol approaches it more closely than phenol or the metallic salts.

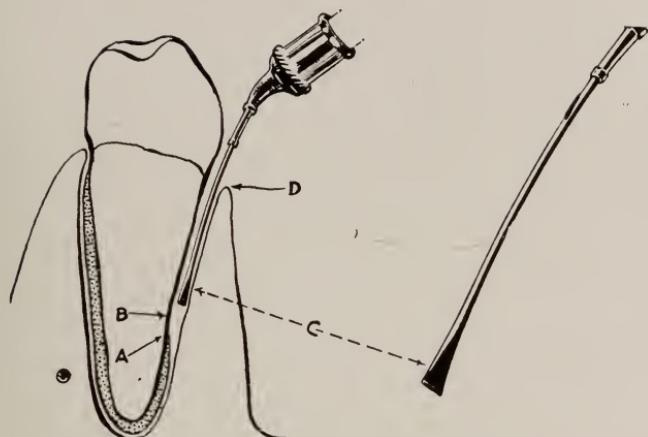
No doubt you realize the importance of phagocytosis as a defensive factor in the healing of injured tissue, and the necessary need of it in combating infection.

Turpentine is a valuable agent to use for the promotion of phagocytosis. It causes a lessening of aseptic inflammation by lessening the formation of exudates, and by hastening their absorption. Turpentine is volatile and will penetrate cell tissue in virtue of this property. Its action is a physical one and does not unite chemically with cell tissue. It is exceptionally efficacious in relieving pain and influencing deep-seated inflammations.

No doubt a great many failures in the treatment of pyorrhea are the fault of the operator in not getting to the bottom of the pocket, either in the removal of deposits or in the application of medicinal agents. We must cause a healing of the tissues from the bottom of the pocket up, otherwise our results are only temporary.

TECHNIQUE OF POCKET TREATMENT.

All pockets are thoroughly irrigated with warm sterile water, to be followed by placing cotton rolls on both sides of the pocket.



A—Peridental Membrane.

C—“Flat tip” of needle.

B—Bottom of Pocket.

D—Mouth of Pocket.

Slide No. 20.—In making the application of dentinol, the flat tip of the needle should be slowly inserted into the pocket and kept in contact with the root of the tooth until the bottom of the pocket is reached, as shown in illustration. When the bottom of pocket has been reached, the needle should be lightly withdrawn to prevent tissues from clogging the opening. Slight pressure should then be placed on the plunger, until it is seen to exude from the mouth of the pocket.

Subsequent treatments are carried on in the same manner.

PROPHYLAXIS.

It should be our aim to leave the teeth as smooth as possible, particularly at their necks, in order to prevent, or at least retard, further accumulations. For this purpose, wood points are used, charged with a fine polishing medium. For the proximal surfaces, a thin tape is used. Care must be exercised in using tape that the interproximal tissue is not injured. This danger can be overcome very largely by holding the tape at an angle, and placing the tip of the finger of one hand against the gum, using the fingers of the other hand to work the tape through.

HOME TREATMENT BY PATIENT.

The cleansing of the mouth by means of the tooth-brush and powder is the fundamental principle of “mouth cleanliness.” Proper cleansing of the mouth cannot be attained by the use of the tooth brush alone, if the best results are sought.

A medium for this should be selected, that will aid in the removal of masses of bacteria clinging to the teeth, food debris, calcic deposits and other adhesions. These collections upon the teeth form a favorable environment for the growth and propagation of bacteria. In addition to the mechanical assistance, this medium should be one that will favor the recovery of inflamed gum tissue, and tend to keep them in a state of health. Clinical experience and scientific research have shown that a combination of White Oak Bark, Peruvian Bark, Elm Bark, Precipitated Chalk and modified dentinol, in carefully adjusted proportions, produces the desired result. This combination of ingredients is known as pyorrhocide, and is used morning and evening by the patient.

I will not endeavor to go into the details of restoration of function by properly articulated fillings, crowns, bridges and dentures, only to say that this should be done when necessary.

SPLINTS.

By the timely use of properly constructed splints, it is frequently possible to overcome the irritation of peridental tissues, occasioned by excessive tooth movement, and to provide that degree of rest which is absolutely essential to reparative processes. In many instances, splints also enable us to save teeth that could not otherwise be retained; and since the loss of a tooth invariably disturbs the symmetrical relationship of those remaining, it is manifest resort to such appliances is needful in the advanced cases.

It is also well to remember that loose teeth can often be splinted in such manner that they serve as satisfactory abutments for bridges or as supports for partial dentures. The possibilities of such splinting of loose teeth should always be taken into consideration before extractions are decided on, lest it be subsequently discovered that no substitute can be made to give satisfactory service.



Before Treatment



After Treatment

Slide No. 21

Slide No. 21.—In this picture we have an advanced case where, in addition to the treatment already referred to, a splint was necessary. In this case it was possible to overcome the inflammation and pus flow temporarily; but on account of the lack of bony support, the teeth were subjected to excessive movement and inflammation again developed. In order to insure the permanency of our results, this splint was used. This case has been under observation for nearly three years, and was treated along the lines already outlined.



Slide No. 23.—Illustration of Splint.



Slide No. 24.—Radiographs.

HINTS ON THE DEVELOPMENT OF PROPHYLACTIC PRACTICE.

The whole story may be summed up in a few words by saying that such a practice is developed by the education of patients to the presence of pyorrhea, to its certain consequences if neglected, the benefits possible by keeping the mouth healthy and in condition to function; and to the fact that clean teeth decay less rapidly than others.

It is easy enough for one who has had years of experience in this work to say, "Educate the patient." But when they began, they did not know so well how to educate patients. And you, who have given this no thought, may not see, just at first, those steps which would be likely to prove most effective. It will, therefore, be in order for me to suggest some methods which have been successful.

And, first of all, I want to set my face like a flint against the slightest intentional misrepresentation to patients, or the use of methods which might be termed unprofessional. The treatment of disabled mouths is not merely a means of getting money out of patients. It is an opportunity to benefit the patient, sometimes to the extent of enabling nature to repair health that seemed permanently broken; often to the extent of restoring the power of mastication and improving the bodily vigor and efficiency. It offers to the dentist opportunities for the exercise of his highest skill in every department of practice. And while I appreciate as keenly as another the financial rewards, I appreciate even more the opportunities to render the patient invaluable professional service.

There are four essentials to the education of the patient. They are arguments or information, illustrations of the different stages of pyorrhea, models showing what damage the disease has done and what may be done to arrest and

repair its ravages, and a few treatments of some limited area to demonstrate to the patient what the treatment effects.

In the use of these elements the dentist should be cautioned to use the utmost patience. He must remember that he is treading on ground which is as yet largely unknown to the public, and is not so well known to the members of the profession as it will some time be.

Moreover, the dentist must remember that we are just learning to give proper attention to the mouth in its entirety; that for many years people have swallowed poisons from their mouths and then died under the hand of a mysterious Providence without ever suspecting the mouth. And when you seek to trace a death to so near-by a cause as an unclean mouth, welling up pus for hourly consumption, you are talking in a new language which the patient must first learn, and then learn to understand. And so I have mapped out a fairly regular course of arguments for patients, which I will outline here.

It is best to select for illustration an affected area in the front of the mouth and a healthy area near by, for comparison one with the other. It is quite natural to enter on an explanation of the causes of the unhealthy condition. These should be kept well in mind.

It is easy to explain to the patient the consequence of merely letting such a condition alone. Not infrequently the mouth will exhibit different stages of the disease, or the progress can be so related that if teeth have been lost by it the patient can follow each step to the final loss of the teeth, the loss of masticating power, and the expense of replacement.

If there are pockets about the teeth, their presence and depth can be demonstrated by inserting an instrument, and then showing the attachment of healthy gum tissue about the necks of other teeth. If the pockets contain pus, some can usually be forced into sight by pressure on the soft tissues. A brief explanation of the causes of its formation, its continual presence, the amount formed, and the fact that practically the only way of getting rid of it is by taking it into the stomach, will instruct many a patient.

I do not believe the danger to the general health from these pus pockets is appreciated even by dentists or physicians as it should be. And I think that without playing the part of an alarmist it should be made plain to every patient.

THE USE OF ILLUSTRATIONS.

Photographs from patients, showing the different stages of pyorrhea are indispensable to me in securing their interest. It is difficult for the patient, whose gums show a slight increase in redness, and who yet feels little or no discomfort, to regard the slight symptoms as the forerunner of anything serious. It can be shown that in certain cases the trouble began in a manner very similar to that shown in the patient's mouth, and ran its course to a severe involvement. I find, also, that when patients have the illustrations before them, explanation as to symptoms are better understood. The eye helps the ear to instruct the mind.

If X-ray photographs are properly used, they can be made a most valuable aid to the other illustrations. But, here in particular, the dentist must remember that he is talking in a little understood tongue. And he must carefully explain to the patient each step. When he has outlined briefly how the pictures are taken, he should explain what each tissue is in the illustrations, and how its condition can be determined by the trained eye by its density as shown in the photograph. In this way, losses of structure about the tooth can be shown, even though they are invisible to the human eye. And if the patient's trouble has reached the stage shown in any of the X-ray photographs, she can be informed that though she cannot see these destructive changes occurring within the tissues they are taking place and will have their inevitable end by merely neglect. She may be informed, also, that she need do nothing to hasten that end. Merely neglecting the condition as it stands will unfailingly bring that end to pass.

THE USE OF MODELS FOR INSTRUCTION.

The use of well-made models is not less valuable in the education of patients than the use of photographs. For while the models may not so well illustrate the initial stages, they illustrate even better the advanced stages and their effect upon the dentures as a whole.

By means of models, the loss of tissues about the teeth can be shown, the wanderings of unsupported teeth out of position, the destruction of the balance of articulation which nature so strongly desires to maintain, and the almost unavoidable exposure of other teeth to undue masticatory stress, with the result of pyorrheal involvement.

The dentist who wishes to make the best use of models of pyorrheal dentures will do well to occasionally refresh his mind by studying a model of good natural dentures, and

noting how carefully nature balances and equalizes the really enormous pressures to which she subjects the teeth in the course of mastication.

The application of a force of 100 pounds, once, is not a serious matter to a tooth, but if that tooth be used 100 times during a meal, and take that much stress, it is *a total of five tons* which that tooth has withstood within the space of perhaps 30 or 40 minutes. Nature's plan is that dentures shall take the strains in such a way that no one tooth shall bear more than its share. And the structure of that tooth and its placing in the jaw will enable it to bear its two or five or ten tons of stress without damage. But if the loss of some teeth has deranged the balance of the dentures so that the tooth takes more stress than it is prepared to receive, inflammation of the tissues about the root will inevitably supervene.

When certain teeth have been lost, so that half the equipment of teeth must do the full amount of chewing, the teeth are exposed to undue pressure and work, with possible danger to the surrounding tissues.

And, finally, such models help in explaining a more distant and more common result of the loss of teeth or their movement out of articulation. It is that nature has set the teeth as guards for the health of the stomach. When they are all present and food is properly masticated, there is little danger of overeating, since the stomach comes gradually to a realizing sense of fulness. But if the teeth are missing, and food is imperfectly masticated, the stomach is unable to send out that advance notice of fulness. And it is not until the stomach is too full that the person receives the warning. The stomach overloaded with imperfectly masticated food is on the sure road to indigestion, with its long train of ills.

IN CONCLUSION.

The dentist who will develop a pyorrhea practice will enhance his reputation, enlarge his clientele, elevate his procedure and increase his income.

It cannot be expected that members of the public who are unacquainted with the possibilities of pyorrhea treatment will be enthusiastic on the subject until their knowledge of the benefits to be received has been increased. But any patient of ordinary intelligence may be educated to the necessity for treatment which will prevent pyorrhea, overcome when present, and can be made enthusiastic as the

work progresses.

The measure of success in pyorrhea treatment will be greatly increased by winning the patient's enthusiastic co-operation. This is not difficult, if certain simple methods are followed. In serious cases it will often come of itself as a result of the physical improvement which is soon apparent.

If, however, each visit of the patient is used as an opportunity for a little educational talk on the teeth, their value in health, the injurious effects of deposits and decomposition of food, a gradually increasing conception of the value of the teeth and surrounding tissues will be formed in the patient's mind, and co-operation to make the most of them will naturally result. Such information can be given in plain words, as a matter of conversation during treatment.

Time spent in presenting these conditions to the patients in need of pyorrhea treatment or its prevention, will be found, in the end, to be well invested. Fifteen minutes spent thus will sometimes either secure the work or so interest the patient as to end with the work being done. Not every patient can be interested, but the time given to those who are never won may be regarded as very well spent, because the number of appreciative patients will be steadily increased.

Draft of Regulations Covering Dental Inspection of School Children, Province of Ontario.

(Submitted by the Minister of Education, for Consideration.)

DENTAL INSPECTION.

GENERAL.

(1)

WHERE provision has been made by any dental hospital board or other association of dental surgeons for the care, without charge, of the teeth of pupils whose parents or guardians are unable to pay therefore, one School Board or a number of School Boards acting together may by resolution decide to adopt a system of school dental inspection.

(2) Where a number of School Boards acting either together, by themselves, or in conjunction with other local organizations approved for this purpose by the Minister, so decide, the system of inspection shall be under the charge

of a Committee thereof, to be known as a School Dental Inspection Committee and to consist of as many members of each School Board concerned as such Boards may mutually determine.

(3) The dental inspection shall be carried on by the Board or the Committee, under the Regulations herein prescribed, by one or more officers appointed by such Board or Committee, who shall be known as School Dental Inspectors and who shall be duly qualified dental surgeons of not less than two years' experience in the practice of their profession.

(4) Where the School Board or the Committee appoints a School Medical Inspector, the School Dental Inspector or Inspectors shall be subject to his general oversight, as limited by the Regulations; otherwise the School Dental Inspector shall be subject to the regulations below.

(5) The cost of school dental inspection shall be included in that of the maintenance of the schools and shall be provided for in the same manner.

(6) When a School Dental Inspector is employed by a Committee, the proportion of his salary to be paid by each of the Board concerned shall be settled by mutual agreement amongst said Boards.

DUTIES OF SCHOOL DENTAL INSPECTIONAL STAFFS.

(1) In such of their duties as affect the organization and management of the schools and classes, the School Dental Inspectors shall be subject to the instructions of the School Inspector.

(2) The inspection of the pupils by a School Dental Inspector shall be carried on at such times as may be approved by the Principal.

(3) Subject to the Regulations and the approval of the Minister, the School Board or the Committee may pass by-laws defining the duties of the School Dental Inspectional Staff and making provision for the carrying out of the work of dental inspection.

(4) The Board or the Committee may pass a resolution requiring every pupil attending the schools to submit once every half year to the Principal of the school, a certificate from a duly qualified dental surgeon that the teeth of such pupil are in sound and healthy condition and do not require dental treatment.

(5) (a) Once every half year and at such other times as the School Board or the Committee may direct, the School

Dental Inspector shall make an examination of the teeth of all the pupils attending the school or schools.

(b) The first half year's visit shall be made at as early a date as is practicable.

(6) It shall be the duty of the Principal to require every pupil to submit to an examination of his teeth, and for such purpose the Principal shall direct the pupil to accompany the Inspector to some suitable room or other part of the building where no other pupils are present.

(7) The Board may install, in a room suitable for the purpose in one or more school buildings, a dental chair for the examination of the teeth of the pupils.

(8) The School Dental Inspector upon completing his examination shall report forthwith in writing to the parent or guardian, through the Principal, whether the teeth of such pupil are sound and healthy or whether they require treatment by a dental surgeon.

(9) It shall be the duty of the parent or guardian of every pupil so notified to have the teeth of such pupil properly treated forthwith by a dental surgeon.

(10) On the report of the Principal, the Board may exclude such pupil from school until he has submitted to the Principal a certificate from a dental surgeon stating that the teeth of such pupil have been properly treated and cared for.

(11) At the close of the second school half year the School Dental Inspector shall make a written report on the general condition of the teeth of the pupils to the School Board or the Committee, and to the School Medical Inspector or the Chief School Medical Inspector as the case may be, with such recommendations as he may deem advisable.

DIAGNOSING THE SEAT OF TOOTHACHE BY HEAT.—Patients very often complain of toothache upon the eating of hot food. The sensitive tooth, however, cannot always be found, by applying hot water from the syringe, since the water invariably comes in contact with several teeth. The offending tooth can readily be determined by grasping a piece of impression compound of the size of a marble with pincers, heating it over an alcohol lamp, and touching with it the teeth suspected.—*Von Beust, Archiv. Fuer Zahnheilkunde.*

Dr. Cummer's Post-Graduate Course.

DR. GEORGE H. WILSON, of Cleveland, Ohio, known in two continents, as the author of "A Manual of Dental Prosthetics," and for his research work on the subject of plaster and vulcanite, has been secured for the Post-graduate Course, to be given in Toronto in September next, under the direction of Dr. W. E. Cummer. It was felt that, inasmuch as without proper manipulation of plaster and vulcanite in denture making, the very finest efforts from a mechanical and esthetic standpoint in the waxed up stage are apt to be lost in the change from wax to vulcanite, and that the most expert instruction on this subject was essential for the high standard aimed at in the organization of the class. On this account especial gratification is felt by the management and by those who have already signified their intentions of taking the course, of Dr. Wilson's presence and instructions.

Dr. Wilson is particularly fitted by experience and ability for post-graduate work. "Wilson, that's all," has become a password for post-graduate prosthetic instruction in many of the larger cities of the United States from coast to coast.

For the purpose of supplementing the thirty-six clinics to be given on the various phases of prosthetic dentistry, removable pieces, impressions, etc., a number of boards are under construction which will bear progress models, showing every step of every piece demonstrated. The study of these will be something of the nature of a post-graduate course itself. The Gysi system of anatomical articulation is proving itself to be more than it promised. Reports from those who are following the principles in practice of Gysi anatomical articulation, and Greene impression technique are reporting results far in excess of those promised. Dr. Gysi's new molds are now available which facilitates the work to a remarkable degree. Dr. Leon Williams system of selection of natural teeth is now before the profession and will be presented with matter gained by experience from now till September. The present indications point to a highly successful class from every point of view.



DR. GEORGE H. WILSON, Cleveland

Dr. Wilson will co-operate with Dr. Cummer in the Post-Graduate Course to be given in Toronto during the first two weeks in September.

Canadian Dental Association.

1914 Convention, Winnipeg, May 25th to 29th inclusive.

PROGRAMME.

DR. R. W. D. N. MOORE, Chicago—Paper and Clinics on Operative Dentistry.

Dr. J. H. Prothero, Chicago—Paper and Clinics on Impression Taking and Cast Construction and the Construction of Anatomical Dentures.

Dr. Forrest H. Orton, St. Paul—Paper: A Yearning for a Solution of the Color Problem of Teeth. Clinics: Anatomically Correct Crowns; Fixed and Removable Bridgework.

Dr. Orton will present a patient showing practical applications of these principles in the mouth.

Dr. E. Fay Tinker, Minneapolis—Paper: Principles of Crown and Bridgework. Clinic: Gold Jacket Crowns.

Mr. J. M. Carson, Calgary—Paper: Business Management of a Dental Practice.

How to Reach Winnipeg.—Buy from your local railway agent single R. R. ticket and secure from him standard convention railway certificate.

This certificate will entitle you to a return ticket for one-third fare if 100 attend, and to a return ticket free if 300 attend.

What better spring tonic than a trip to Winnipeg? Four days of real pleasure and profit at the convention with as many hours or days added as the individual fancy may dictate.

Accommodation.—Special rates will prevail at all Winnipeg hotels.

Letter from the President of the C.D.A.

The following letter has been received from the President of the C. D. A. and breathes the spirit of cordiality and good fellowship that pervades the entire executive force of the 1914 convention.

To the Dental Profession of Canada:

My dear Friends,—Those of you who were at the business meeting of the C. D. A. at Burlington in 1912 will remember I stated that if the 1914 meeting was held in Winnipeg, you who should come to it would find that the next was still the best, and that you would find here a gathering of the most congenial fellows to be found anywhere.

I stick to that statement, and if you don't believe me come and see—those who do believe me are sure to come.

The enthusiasm and good will which the Winnipeg men are showing in preparing for this meeting will surely result in a record meeting.

Hoping to be able to shake hands with all my old and many new friends May 26th-29th, I am,

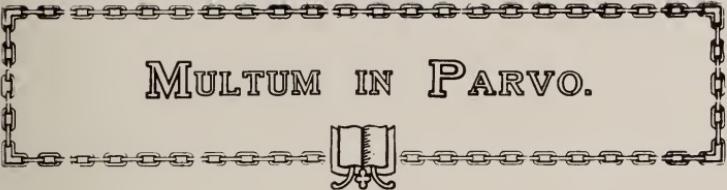
Faithfully yours,

(Signed) GEO. F. BUSH,
President Canadian Dental Association.

Eastern Ontario Dental Association.

CHE Annual Convention of the Eastern Ontario Dental Association will be held in Cornwall, June 24th 25th and 26th next.

C. H. JUVET,
Secretary E. O. D. A.



MULTUM IN PARVO.



This Department is Edited by C. A. KENNEDY, D.D.S., 2 College St., Toronto

Librarian, Royal College of Dental Surgeons of Ontario

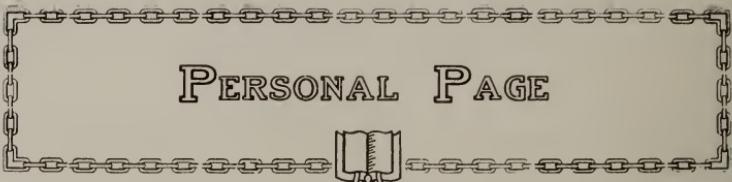
*Helpful Practical Suggestions for publication, sent in by members
of the Profession, will be greatly appreciated by this Department.*

SUPERSTITION AND TOOTHACHE.—At the Dorset Field Club's meeting on February 3, Mr. Rawlence, of Salisbury, quoted instances of superstitious folk-lore in Dorset. As recently as 1910 a leading auctioneer in the county told him he had been suffering from toothache and on the way to the dentist he met an old farmer client, who, learning where he was going, said: "Don't go there; I'll tell 'ee how to cure it. You go to a young oak tree and put your arms round it and mark the place where your fingers meet. Then hit a slit in the bark with your knife, put your left hand behind your head, and pull out some hair behind your right ear, and put it in the slit of the bark, and you'll never have the toothache again."—*British Dental Journal*.

DISCOLORATION OF GOLD FILLINGS.—Discoloration of gold fillings is due to electric deposition of copper from amalgam fillings containing much copper. Discoloration in the walls of a tooth is due to leakage from faulty manipulation, and may occur from outside between the walls and the filling or from the pulp chamber. Pitting invariably follows as a result of insufficient condensation.—*W. H. Gilmore, Dental Record*.

PROTECTING NEWLY MADE CEMENT FILLINGS.—A good protection for newly inserted cement fillings consists in a mixture of equal parts of paraffin and resin, with which the filling is coated, and which greatly enhances the density of its surface.—*Monatsschrift f. Zahnheilkunde u. Zahntechnik*.

POURING MODELS.—Never wet a compound impression just previous to pouring plaster for a model, as the model will be crumbly on account of superabundance of water and crystallization does not take proper form.—*Jacob W. Greene*.



PERSONAL PAGE



DRS. FRED MOFFATT and Ben. J. Curry had a narrow escape from death a few weeks ago when fire occurred in the Scott Building, in Winnipeg. The whole building was a seething mass of flame in a comparatively short time, and retreat through the ordinary channels was quite impossible. Dr. Moffatt reached a fourth-storey window, and, swinging himself out, hung suspended by his hands from the window ledge and secured additional support by kicking in a lower window and standing upon the slender crossbar of the window sash. Dr. Moffatt kept his nerve, and hung on until a life net was spread. Unfortunately, in dropping into the net, his back was severely injured, as the distance he fell and the weight of his body caused the receptacle to sag badly.

The escape of Dr. Curry was equally thrilling. When the heat in the room became unbearable and the smoke almost suffocating, Dr. Curry climbed out on to a narrow stone coping at the fourth floor, and for several minutes remained there with his body flattened out against the brick and the tips of his fingers grasping a ledge above him. Extension ladders were soon run up, and from his precarious position Dr. Curry reached the ladder and descended in safety. Curry, upon reaching the ground, appeared to be less excited than many of the spectators, and was freely congratulated upon his escape and exhibition of cool nerve. ORAL HEALTH is glad to report that Dr. Moffatt is progressing very favorably. The injured parts will, however, be encased in plaster for a number of weeks yet.

Dr. J. E. McDonald, of Calgary, Alta., was selected a member of the S. S. Board of Education at the civic election held in that city in December last. The question of Dental Inspection and Oral Hygiene in the schools is now being advocated by him, and will no doubt soon become a part of the school regulations. Dr. McDonald, previous to going to Calgary, four years ago, taught school and practised his profession in his home town, Summerside, P.E.I.

Dr. Eudore Dubeau was recently re-elected to membership in the Montreal City Council.

Dr. A. A. Smith, of Cornwall, was elected Vice-President of the Technical Educational Association of Ontario at the organization of that body in Toronto a few weeks ago.

ORAL HEALTH.

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Vol. 4

TORONTO, MAY, 1915.

NO. 5

EDITORIAL.

Draft of the New Regulations Covering Dental Inspection of Schools in Ontario.

ELSEWHERE in this issue will be found the draft of the proposed regulations covering dental inspection of school children in Ontario. These proposed regulations along with the amended courses of study in the Public and Separate Schools, were submitted to the Ontario Educational Association at its recent meeting that any suggestions for their improvement might be submitted to the Minister of Education before their final form is decided upon.

Of special interest to the dental profession are the sections dealing with dental inspection. It will be noted that school dental inspectors are to be required to have at least two years' experience in the practice of their profession. In another section the Board or Committee is given power to require every pupil to submit only every half year, to the principal of the school, a certificate from a duly qualified dental surgeon, that the teeth of such pupils are in sound and healthy condition and do not require dental treatment.

In a subsequent section the Board is given power to exclude a pupil whose parents do not provide the treatment required.

Some changes are necessary before the regulations, as submitted, will meet the entire approval of the dental profession. The draft has been issued by the Department of Education, however, with the assurance that any suggestions for the improvement of the regulations will be duly considered and transferred to the Minister.

With some changes and additions to eliminate the lack of clearness of the intent of certain sections and to more specifically provide for dental treatment of those children whose parents or guardians are unable to pay for it, the regulations should place the question of dental inspection and treatment of school children in Ontario upon a sound and permanent basis. It will only then remain for Boards of School Trustees to take advantage of the powers placed at their disposal.

Dr. Cummer's Post-Graduate Course.

WE draw attention to the announcement in this issue of further particulars concerning the post-graduate course in dental prosthesis to be given by Dr. W. E. Cummer. No man in Canada is more capable of giving such a course and few enjoy the admiration and respect of the dental profession to the same degree as does Dr. Cummer.

The theory and practice of dental prosthesis are so fundamentally different to-day from what was taught a few years ago, the majority of practitioners will appreciate this opportunity of becoming familiar with modern practice in this important department of dentistry.

Those interested should write Dr. Cummer at once, as we understand the intention is to limit the membership of the class. Address Dr. W. E. Cummer, 2 Bloor St. E., Toronto.

Swat and Starve the Fly.

MAY is the month for the most effective campaign against the fly. If you kill each fly as it comes out of winter quarters you will save the trouble of killing millions of them later.

TIME AND ENERGY.

Success is strictly a thing of energy and hours.
Enough energy and enough hours and you
may shake hands with success. You've
got to keep at both to reach her.
You've got to keep at both to
keep her. You've got to
work harder to keep
her than to
reach her.



J. Wright Beach, D.D.S.

BUFFALO, NEW YORK

Dr. Beach, Contributing Editor to *Oral Health* under the
pseudonym of "Habec".

ORAL HEALTH.

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION"
AS WELL AS THE "POUND OF CURE."

VOL. 4.

TORONTO, JUNE, 1914

No. 6

*Local Anesthesia with Special Reference to Conductive Anesthesia of the Fifth Nerve.**

BY DR. GUY R. HARRISON.

CHE subject which I have chosen is one that has been covered again and again, but as advances are being made all the time in this line of work I hope it will not prove too tiring.

The term local anesthesia is a misnomer. Anesthesia means, as the term is usually used, complete loss of sensibility. The term applied to loss of sensibility to pain in a part is certainly not correct. The term local analgesia is a more correct and better term, since analgesia means absence of sensibility to pain. Efforts towards the reduction or abolition of pain have occupied a large part in the history of practice of the healing art. The first record I can find of it I obtained from an encyclopedia. It states that in the year 50 A.D. Dioscorides made the attempt to anesthetize the skin by powdering the memphis stone, making a paste of it with vinegar and applying it to the skin. The stone mentioned must have been some carbonate and the acetic acid in the vinegar liberated carbon dioxide, thus producing cold and slight anesthesia.

The branches of medicine that had to do with surgery have, through necessity, tried to reach the goal of anesthesia. Operative procedures in or about the mouth, particularly upon the teeth, being so much more painful in comparison

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with other parts of the body that dentists have striven to accomplish anesthesia. The work that has been done in both general and local anesthesia by American dentists should be a matter of pride to us all. The pioneer workers after general anesthesia were dentists and the work of Wells and Davies with nitrous oxide, Morton with ether, Hall, Halstead, Pruyn and others in the field of local anesthesia should be recognized. In 1886 Richardson demonstrated anesthesia with the ether spray. This stimulated research workers and somewhere about this time the hypodermic method of administering drugs was discovered by, I think, Moore and first used in a practical way by Wood of England. Various drugs have been used, principally cocaine and its substitutes. The first demonstration of the anesthetizing power of cocaine was by Koller in Germany in 1884, since that time many substitutes have been exploited, but most of them being synthetic preparations of cocaine. Among these are Alpha and Beta Eucaine, Acoin, Holocain, Tropococaine, Orthoform, Stovain, and lately Quinine and Urea Hydrochloride, Novocain and others. The last named drug seems to have come nearer the ideal for local anesthesia than any of the others. Printz says, "Novocain alone fully corresponds to every one of the demands to be made upon a local anesthetic." Braun says, "Novocain is an ideal anesthetic which cannot only supplant cocaine in every case, but considerably enhances the safety of local anesthesia, owing to the possibility of safely injecting much greater quantities of a strongly anesthetizing solution."

The last number of the *Journal of the American Medical Association* contains an article by Dr. Mitchell, of Washington, D.C. Dr. Mitchell was chairman of a committee appointed to the A. M. A. to investigate local anesthesia. Their report was rendered two years ago, but he states in his paper that "there has been made such great advances since our report was rendered that I feel justified in making a supplemental report" and further says, "of all the advances which have been made none was greater than the almost universal substitution of novocain for cocaine." Novocain is also used extensively by Dr. Southgate Leigh, of Norfolk, Va.

The great objection to cocaine is its toxicity. Novocain is placed as being seven times less toxic and differs in a marked manner in other ways from cocaine. We will now briefly compare them. Cocaine is a marked protoplasmic

poison to all kinds of tissue, a marked constrictor of arterioles, a powerful circulatory and respiratory stimulant in the first of its poisoning stages. This makes it contraindicated in the aged and debilitated patients, and particularly in the case of chronic alcoholics, or in any condition where the arteries are hardened, or where marked heart lesions are present or in the case of persons of a highly nervous temperament. Upon the eye it produces mydriasis, raises intra-ocular tension and impares accommodation. Its solutions cannot be sterilized by boiling, as heat will decompose it, although authorities differ as to this.

Novocain, the tissues stand it well, and it has a slight vasodilator effect. This is one reason that the tissues will remain anesthetized is shorter than that of cocaine. This can be overcome by the use of the extract of the suprarenal gland. We must not forget that cocaine is a protoplasmic poison and that the length of available anesthesia is due to this in a measure. It does not raise blood pressure or stimulate respiration to a noticeable extent. Upon the eye it does not produce mydriasis, disturb accommodation or raise intra-ocular tension. Truly a marked difference from cocaine, which as I have stated, does. Its solutions can be sterilized by boiling, its anesthetizing power fully equals that of cocaine, and its solutions are neutral.

The dose of novocain is larger than that of cocaine. The average dose of cocaine is $\frac{1}{2}$ gr. The rule is by hypodermic administrations $\frac{1}{2}$ of the dose by mouth this would make it $\frac{1}{4}$ gr., so in using a 1% solution, one 30 minim syringe would represent a dose. Novocain can be given in much larger doses with perfect safety. I have administered as much as 2 grs. in twenty minutes without the slightest ill effect. Its maximal dose is given by Liebel as $7\frac{1}{2}$ grs. The ideal anesthetic solution must be as follows. It must allow of sterilization by heat, must not produce tissue lesions either of blood or tissue cells, must not produce Edema, must not react acid, must allow of combination with suprarenal preparations, must allow of the addition of some antiseptic to preserve it, and must be isotonic or nearly so. The novocain solution, the formula for which I will give, has all of the above features.

Now a word about isotonic solutions which plays a very important part in the result of local anesthesia. The physical phenomena of osmosis, or the passage of liquid through an animal membrane, plays a large part in body metabolism,

It allows of interchange of substances from within the cell, and from without through the cell wall, equal osmotic pressure on both sides of a membrane is known as isotonia. Our object then is to have our solution as nearly equal in osmotic pressure as we can to that of the protoplasm within the cell wall. A .9 of 1% solution of sodium chloride is isotonic for man, that is equals the osmotic pressure of the bloos plasma for man. If we have the solution of a higher osmotic pressure than the substance within the cell, the cell will extract water from the solution and produce swelling of the cell. This solution would be a hyperisotonic solution. If on the other hand our solution were of a lower osmotic pressure than that within the cell the solution will extract water from the cell, the cell will then shrink and die. This has been proven theoretically and clinically. This is the solution that I use, which is nearly isotonic.

R Novocain	grains 6.4
Sodium Chloride	grains 5.4
Phenol	grains 4
Distilled water (that has been boiled)	ii ⁵

A few words in explanation of the above formula. The per cent. of novocain is less than three-fourths of one per cent., and each 30 minim syringe full equals .2 grains of the drug. The amount of sodium chloride equals a.6 of 1%, a normal saline solution from a chemical standpoint, not a physiological saline solution, which is as I have stated a.9 of 1%. The phenol is a protection against vegetable organisms that might get into solution by opening container. Extract of the suprarenal gland I prefer Parke Davis Company's preparation, solution of Adrenalin chloride. It is added only at time of operation as it will decompose the solution. Its use makes the solution more valuable, as it counteracts the slight vasodilator action of novocain and prolongs the action of the drug. We must bear in mind that suprarenalin is a most powerful acting drug and must be used carefully and not used at all in cases where raised blood pressure would be dangerous. Over six or eight minims should not be used (I refer to the 1-1000 solution of Adrenalin chloride) at one time.

The following apparatus is needed for the manufacture of the solution. Two chemical flasks, several size funnels, white filter paper, and test tube holder for handling flasks. Have all of the containers sterile, add drugs except phenol.

This is added into container and boil solution for about five minutes, filter when cold into container and seal. The following is the method I use in handling the drugs. I have the novocain and sodium chloride weighed and put into capsules; 6.4 grains of novocain in pink capsules and 5.4 grains of sodium chloride in white capsules. This is a convenient and accurate method of handling them.

Selection and care of syringes and needles. I prefer the "Luer" 5c.c. all glass syringe as it permits of easy sterilization. I use 1½ inch needles, both straight and curved platinum-iridium, but steel needles are all right. With a 1½ inch needle one can gauge the depth of insertion, and they are long enough to reach the deep branches of the fifth nerve.

Examination and preparation of the field of operation.—This cannot be too strongly emphasized that in conductive anesthesia of the fifth nerve, which I will describe later, the importance of having the needle, syringe, solution and field of operation sterile, as infection would mean a serious condition. Note all pathological lesions or conditions found at or about field of operation and all abnormalities, etc. This data at times is very, very valuable. Swab the dry mucus membrane well with 3½% tr. iodine; there is nothing better, as it is the best antiseptic we have for the mucus membrane. We will now briefly review and point out on skull the nerve supply of the jaws. To get results with local anesthesia we must be thoroughly familiar with the anatomy of the parts.

The fifth pair of cranial nerves are the ones we are chiefly concerned with, although by anastomosis they connect with others which we have to take into consideration, particularly the seventh and twelfth nerves. The fifth nerve has its origin at the Pons Varolii and extends to the apex of the petrous portion of the temporal bone. Here the Gasserian ganglion is located. The fifth is a mixed nerve, that is, it has both motor and sensory branches. It is sensory to the integument of head, face, dura mater, ball of eye anterior portion of the outer ear, external auditory canal, and mucus membrane of nose and mouth. It is motor to muscles of mastication tensor of palate, mylohyoid and part of digastric, and also with or through its anastomosis supplying anterior part of the tongue. Its branches of distribution are many. It has three main divisions, designated as first, or ophthalmic, second, or maxillary and third, or mandibular. The first does not concern us very much, and the third is the only one having motor endowments, it passes beneath the

Gasserian ganglion and has no connection with it. We will take the second division. It makes its exit from the cranium through the foramen rotundum (I will only take the branches that supply our particular field, the teeth and their associated structures) crosses the sphenomaxillary fossa, enters the orbit through the sphenomaxillary fissure lying in the infraorbital canal in the floor of the orbit and makes its exit upon the fact at the infraorbital foramen. The branches given off in the sphenomaxillary fossa are spheno-palatine, and posterior superior dental, the last named branch is given off just before the nerve enters the infraorbital canal, generally two in number, and passes downward upon the tuberosity of superior maxillary bone, giving off small branches to the gums and mucus membrane of cheek, enters the posterior dental canals on zygomatic surface of the superior maxillary one. It communicates with the middle dental branch by a plexus, gives some branches to the lining of the maxillary sinus and divides and supplies the pulps of the molar teeth.

Now take up the middle superior dental and anterior superior dental, both being given off in the infraorbital canal. The middle is given off just after the nerve enters the canal, passes down in a canal in the outer wall of the antrum and supplies the bicuspid teeth. It communicates by a plexus with the anterior dental branches. The anterior superior dental branches are given off just before the nerve makes its exit upon the face, passes downward in a canal in the anterior wall of antrum and supplies the cuspid and incisor teeth. It also supplies the mucus membrane of the forepart of the inferior meatus and the floor of the cavity.

The palatine branches.—It is sufficient to bear in mind that the anterior palatine nerve descends through the posterior palatine canal, makes its exit through the posterior palatine foramen, passes forward in a groove upon the hard palate, supplying the gums, mucus membranes and glands of the hard palate, and communicates anteriorly with the terminations of the naso-palatine nerve. The naso-palatine nerve makes its exit upon the palate through the foramen of Scarpa, supplying the mucus membrane behind the incisor teeth. This completes the upper jaw.

Next we take up the third division or mandibular branch. It makes its exit from the skull through the foramen ovale and at once divides into two branches, anterior and pos-

terior. The anterior is mostly motor, and the posterior mostly sensory. The buccal is the only branch of the anterior portion we will take up. It supplies the mucus membrane to the gums (buccally) in the molar and bicuspid region. Of the posterior we will only take the lingual and inferior dental branches. The lingual is in close proximity to the inferior dental until it (inferior dental) enters the inferior dental canal. It supplies the mucus membrane and gums upon the whole lingual surface of the lower jaw. The inferior dental branch is the largest of all the branches of the inferior maxillary nerve. It passes downward to the inferior dental foramen, enters it, passes forward in the inferior dental canal, giving off branches to the teeth until the mental foramen is reached. Here it divides into two branches, one making its exit through the foramen, the other continuing forward in the bone to anastomosis with its fellow of the opposite side, and to supply the cuspid and incisor teeth. This completes the nerve supply of the teeth, and while rather tiring, it is absolutely necessary to know to get good results with anesthesia of the parts. I have purposely left out the blood supply, as it is only important to remember the location of blood in order not to wound them or to inject anesthetizing solutions into them. You will note the relations of the nerve supply to the teeth of the upper jaw to maxillary sinus.

Having familiarized ourselves with the anatomy of the parts we will now take up the two methods applicable to this region, namely, mucous or infiltration, and conductive or nerve trunk blocking. A third, or intervenous method does not interest us, not being applicable to our region of work. All of us are familiar with the mucous method, and the only thing that I wish to call attention to is the insertion of the needle, not into gingival papilla, but as near opposite the apex of the root as possible on buccal and labial surfaces, and on palatine surfaces not as high towards apex of roots of the teeth on account of palatine vessels, and not as prominent a curve of alveolar process. Holding the flat side of point of the needle towards the bone always in either method. There are two reasons for this. To allow the easy escape of the fluid in the direction that we wish it to go, and to prevent the tearing up of the periosteum. The object of inserting needle high up or carrying it well up towards the apex of the root is this. Looking carefully at the several skulls I have here you will note the number of small fora-

mina in alveolar process communicating with the alveolus. These allow the anesthetizing solution to come into contact with the nerve tissue within and supply the periodontal membrane.

In cases where pus or gases are present do not insert needle into edematous area, but utilize your knowledge of the nerve supply and infiltrate surrounding tissues.

We will now discuss conductive method and demonstrate on skull, taking the lower jaw first. This method is simple. It is just a practical application of our knowledge of the anatomy of this region. The inferior maxillary branch of the fifth nerve is easy to locate. Of course the number and points of insertion of needle depend upon what area we wish to anesthetize, as for instance, injection at inferior dental foramen would affect molar region, but not bicuspid region.

By palpation.—Backwards over the occlusal surface of the molars our finger will drop into a depression back of last molar. This depression, or fossa, is known as the retro-molar fossa or triangle. Having located this we next by palpation upwards upon the internal surface of body of ramus locate the sigmoid notch. Holding our index finger of the left hand upon the face of the lower jaw opposite sigmoid notch which point is just in front of angle of jaw. A point midway between thumb and index finger will give the location of the inferior dental foramen, that is in regard to its superior-inferior position. Next with index finger locate anterior border of ramus and with the thumb upon the face locate posterior border of ramus. Fingers should be in centre of ramus from above downwards, two lines drawn from before, backwards, and from above downwards between index finger and thumb will cross, as you see in looking at skull, at the foramen, although age has to be taken into consideration, as you know the position of the foramen differs in children and adults, and in adults and old age. In children it is located slightly lower and in old age slightly forward due to changes in lower jaw.

Having located the foramen we now insert straight needle, just internal to the internal oblique line on anterior border of ramus, holding needle close, in fact in actual contact, with the bone. This can be told by the sense of touch. Now I wish to call your attention to this fact as you see by the skull, that the syringe must not be held parallel with the body of jaw. If it is held parallel the needle will go too far

internal, so hold syringe so that it rests about the cuspid region of opposite side. The depth of insertion of the needle is gauged by the size of the jaw, which can be easily known by comparison of the various landmarks, but usually three-fourths of an inch is about the right depth. The main things to guard in this connection are needle not carried far enough back, and needle carried too low. If not carried high enough the lingua overhanging foramen will interfere with fluid coming in contact with the nerve. If this is carried out properly it will anesthetize the molar region on side injected. Inject from $1\frac{1}{2}$ to 3 C.C. of fluid and wait twenty minutes to operate, but if much work is to be done it is better to also inject buccal and lingual nerves in second molar region on buccal and lingual sides. The above method is particularly indicated in removal of impacted third molars, as we all know that these trouble makers are easier removed under a local than under a general anesthetic, provided of course, a good result is obtained with a local anesthetic agent. If proper technique is employed in this injection all of the surgical procedure necessary for the removal of any of these cases can be done without pain.

I think that you will agree with me when I say that the lower molars give more trouble in their removal under mucous anesthesia than any other teeth. This is due to the dense bone in which they are located. If we wish to anesthetize the bicuspid, cuspid and incisor region we have to make additional punctures, two in number, at mental foramen and deep into incisor fossa. The injection into the incisive fossa needs no description, so I will just describe the location and injection of the mental foramen. It is usually situated between the first and second bicuspid teeth, but of course lower down than the apex of the root of these teeth. It is usually nearer the inferior than the alveolar border of jaw, so carry the needle well down. I use a curved needle here as it is easier to handle. Bear in mind that in old age, or in persons that have lost their teeth, both the inferior dental and mental foramens are situated slightly forward. A line drawn across both superior and inferior orbital foramen, both of which are easy to locate, will also cross the mental or in its region. We must bear in mind that it is only necessary to inject in vicinity of nerve trunks, and it is not necessary to use great pressure except in one instance which I will call your attention to later.

We will now discuss the anesthesia of the superior maxil-

lary division of the fifth nerve, but let me again state that to get good results with conductive anesthesia we must be familiar with the anatomy of the parts. I also call close attention to the manner of inserting needle. Do not use much force for fear of breaking needle, use slight pressure while carrying needle into tissues upon piston of syringe for the escaping fluid exerts an anesthetic effect upon the tissues. For anesthesia of the molar region of upper jaw, insert needle back of zygomatic process of maxillary bone at the maxillary tuberosity. For this I use a one inch reinforced needle over the roots of the third molar, pass it upwards and then slightly backwards hugging the rounded surface of the bone. Insert needle from $\frac{3}{4}$ to its full length. Inject from one to two C.C. of solution, again insert needle palatally at posterior palatine foramen and inject about $\frac{1}{2}$ C.C. of solution. Do not use much force or large amount of solution here on account of loose connective tissue being in this region. The foramen can be easily felt upon the posterior surface of the hard palate. For the bicuspid, cuspid and incisor regions injections are made at infraorbital and anterior palatine foramen the location and injection of the last named being so simple it does not need a description. The infraorbital foramen is situated just beneath the floor of the orbit, and a line drawn directly downwards from above, crossing centre of orbit will locate its position. Lifting the lip well up, insert a straight needle at reflection of mucus membrane of canine eminence, and with the tip of one finger upon the face over foramen, carry the needle upwards and backwards in direction of finger upon the face. When the needle is felt beneath finger upon the face inject from half to one C.C. of solution with some pressure, as in this case we want to force the fluid into infraorbital foramen in order to reach the middle superior dental branches of the fifth nerve, massage will also help. In either of the above injections wait from 8 to 15 minutes before beginning to operate. The time for available anesthesia in different cases vary greatly as there are so many factors that influence this. We should bear in mind that as soon as we make an incision in soft tissues that we call fluid to escape and thus shorten the time of anesthesia, as in any of the above injections anesthesia will last from a half to two hours. In case of very nervous or timid patients give the following prophylactic treatment a few hours before operation, as it makes the patient a much better subject for local anesthesia, and thus we get better results.

R Sodium Bromide gr. XX
Ft. powder No. 1
Sig.—At one dose.

Treatment of toxic effect.—I have never seen any toxic effect from novocain, but it is well to bear in mind that the treatment, as in the case of cocaine, would be as the symptoms arose. There is no known antidote for cocaine so the symptoms have to be watched and treated as they arise. In first or at stimulating stage depresents are indicated, later or paralytic stage give stimulants as caffenne, ammonia or strychnine. Death in cocaine poisoning is due to over stimulation and depression. The convulsions appear like those of strychnine of spinal origin, saline intervenously would be indicated, but as I have said, each case must be treated as symptoms arise. As to idiosyncrasy to the drug we are liable to find cases that have an idiosyncrasy to novocain, but I have never seen one or seen one reported. I have seen one case where .2 grs. of cocaine produced hallucinations in about 3 minutes. When we consider that the time of circulation is about 23 seconds, and in this time the drug can have reached the centre, this rapid reaction to the injected drug can be explained.

Cocaine is a most peculiar drug. We may find some individuals whose idiosyncrasy is not toxic, but is of the type that the drug will not have the desired anesthetic effect.

Failure can always be traced to faulty technique or idiosyncrasy. Children bear the drug well, just proportion dose as compared to adults. I might mention in closing that the following will control the post-operation pain of extraction and will also in a great many cases control hemorrhage:

R Orthoform.
Ft. stiff paste with glycerine.
Sig.—Orthoform paste.

Pack this paste into tooth socket and the patient will thank you.

Buffalo Letter.

BY HABEC.

POSTURE.

POSTURE, as related to the dentist, is a subject that has been rattling around in Habec's idea mill for a long time, and until the talk upon this subject recently given in Buffalo by Dr. Goldwaite, the eminent Boston specialist, it had not assumed concrete form. It has ceased rattling and is now about ready to break out upon the patient readers of this journal. Did you ever give the subject of posture serious consideration in relation to yourself? You know the All-Wise Being originally designed certain parts of the body to stand on and to sit on, and to date we believe no one has been able to improve upon this general arrangement. In fact, the subject appears to us to be of sufficient importance to be included in the instructions to the dental student. Habec has endeavored to impress the matter upon the students to whom he lectures, and is now seriously contemplating including a full illustrated lecture on the subject in connection with the regular course on Economics. Only last week a dentist friend explained about a distressing pain in the right side from operating, which at times was so severe as to require his enforced rest for several days at a time. Now, do you get the practical point back of the idea? Let your dental chair be your back. It can at will be placed in any position you desire, so that you may stand squarely upon your two feet while performing nearly every dental operation. The chair should be raised so that the patient's head rests opposite your shoulder, and tilted to a position so that a slight forward incline of your head gives you direct vision into the mouth mirror for all work upon the superior teeth. Operating by reflected light in every case, except where direct vision may be had from this position at the chair, should be employed. Operating on the labial surfaces of the six anteriors, both upper and lower, oftentimes may be done to better advantage by standing in front of the patient elevating the chair to a position that brings those surfaces but slightly below direct horizontal vision. Thus you may stand with the shoulders in a natural position and be in full command of your body. By assuming a natural, easy position, backache should be the exception instead of the rule among dentists. For better

than twenty years Habee has operated continuously on an average of seven hours a day, holidays excepted, and has yet to experience his first backache from this cause. The only explanation he has to offer is contained in the foregoing remarks. Stand squarely upon both feet and let the body swing freely from the hips, is the best solution for that tired feeling of the dentist, that we know of. The "in-curve," the "out-curve" and the "cork-screw curve" have their place in baseball, but not in the dentist's anatomy. The social aphorism that "position is everything," is even more applicable to the dentist, for his position at the chair is, to some extent, indicative of his degree of refinement as well as his good sense and training. Another point might well be emphasized; the operator should assume such position that he may avoid resting against or coming in undue contact with the patient in any way. Personal contact to the refined is at least distasteful and to the unrefined is apt to be misjudged. One can completely avoid such possibility by taking the correct position. We also believe that much of the eyestrain to which we are constantly subjected, is due to indirect vision primarily due to this cause. In fact, many of us are all mixed up both externally and internally. No doubt many of us would have to get a search warrant to locate many of our interior decorations. Some of our gymnastic contortions are really marvelous, yet there is no operation upon the teeth that calls for more than a slight forward tipping of the head or a little rotating of the body. To be sure it is often necessary to rest the body upon one foot, not only for relaxation, but also to reach the foot control of the engine, but the rule must have the usual exceptions to prove it. We can picture the surgeon's difficulties in exploring a dentist's internal regions. More than likely he would find the oesophagus doing the "serpentine" with the manubrium; that the liver had put the lights out, with a spleen against the kidney or too much gall, as usual; the umbilicus had landed on the solar plexus and the heart had gone down to colon. These are a few of the dire possibilities which might result from improper posture, not to mention the cases of simple nerve pressure from which dentist's may suffer and which is often due to this cause. And speaking of sitting. Why! that great privilege suffers even greater abuse and misuse than that of standing. We all have experienced the great difficulty of placing the limp patient who sits on the spine in a position so that comfortable operating is possible. They are continually slipping down

in the chair and persist in poking the chin into the breast bone. No dental chair is capable of adjustment to such shapes. The modern young lady is the greatest aggressor, and it is our duty to give them a lecture on posture without delay. The position of the patient has much to do with the position of the dentist, and vice versa. But this matter of correct sitting may be applied to the dentist also. Do you know that you can sit more comfortably and rest much better by sitting back in the chair and then allowing your shoulders to repose easily against the chair-back? Crossing the legs should also be avoided, for it throws the body out of perfect poise and causes imperfect circulation and nerve pressure to the lower extremities. Some day this subject will be taught in our schools and surely should be taught to dental students and put into practice in the clinic. The lesson to be gleaned is to use the various parts of the anatomy for the purposes laid down by the law of common sense.—Selah!

FRANK LIBERTY SIBLEY.

Frank Liberty Sibley is gone. Perhaps many of the readers of ORAL HEALTH will say, "Well, what is that to me? I didn't know Dr. Sibley." To such Habec can say, "Yes, you knew him, but you did not realize it," you knew him in the image of someone else, for such splendid natures may be found within the acquaintance of each of us. Yet he was different from all others and he was *your* friend. Encompassed by his broad and noble nature were the cardinal virtues of Friendship, Charity, Humility and an all-pervading spirit of Justice which elevated him to heights far above that attained by the average individual. To those who enjoyed his personal acquaintance, whatever may here be said, cannot alter their opinion of him. This is not intended as a eulogy, but is a plain recital of facts that tell us of the short life of one of nature's noblemen from which we may glean many a lesson that may be applied to our individual welfare. Frank Sibley was Habec's best friend and from the time we met as struggling students until the Unseen Hand pressed down his weary eyelids for that endless sleep, that friendship germinated and grew stronger and greater with each succeeding year, constantly nurtured by those sentiments which makes true friendship almost the greatest birthright of man. Thus Habec is privileged to extole his virtues and mitigate his frailties. It is said that the greatest men have the smallest weaknesses, and Frank Sibley's weaknesses were small when compared to the bigness of his mind and his heart. Few men have been endowed with such unusual

sense of the imaginative. Many of his happiest hours were dreamed away in the seclusion of his study, and while the prosaic world slumbered, surrounded by the pictures of those he loved, his favorite books and many reminders of the happy past, he loved to let the imagination run riot. In the blue, curling smoke of his favorite cigarette many a beautiful picture was unfolded to his subconscious vision, and the choicest gems of his thought were indelibly fixed as the blue rings faded away. He lived a goodly portion of his forty-five short years in a sphere where none can enter without the spirit of the poet or an imagination such as he revered in his beloved Ingersoll. Only those who may dwell in this enchanted realm know true life. Sordid surroundings, even squalor and filth cannot separate the elect from this happy intercourse with the essence of superlative joy. He who never has crossed the threshold of this enchanted realm where mind reigns supreme, has beggared his soul and starved his better self. Frank Sibley's pregnant mind fed his glowing soul and thus prepared him to meet Him who sitteth as the Judge Supreme. O! brothers of our profession, if you have never soared on the wings of the ethereal enchantress, take flight at once and sail into that happy domain where our absent friend loved to loiter and surfeit both mind and body with that satisfying relaxation which our nerve-racking life demands. This is one of the practical lessons Habec would have you accept. Frank Sibley's noble heart knew naught but charity and humility. Arrogance and self-conceit were too mean to find lodgment in his democratic composition. Let us throw just one picture on the mental screen that will show you more than meagre words can tell: A dirty, ragged and repulsive looking Italian boy came to the free dental clinic for treatment, and Dr. Sibley took him in hand. His face was so deeply besmeared with dirt that the doctor escorted him to the wash-bowl and with soap and water he began the long delayed process of endeavoring to dig out the boy's face. After much resistance by the urchin and a proportionate amount of muscular resistance by the operator, a really bright and intelligent, swarthy skinned little face was unearthed. The next process was to surprise the teeth in the same manner and after an equally strenuous performance a regular set of clean, white teeth were brought to view. The mirror was then placed in the little fellow's hand and the effect was keenly watched. When the clean little face was reflected in the glass, a look of puzzled astonishment lingered for sev-

eral seconds which was followed by a broad grin disclosing the new white teeth which constituted shock number two. That little Italian boy ever since has revered Dr. Sibley, and from that moment faithfully followed the instructions given him and has become a regular devotee of personal hygiene. This phase of Dr. Sibley's character made him beloved by everyone and no one enjoyed a greater circle of friends and admirers. Dr. Sibley died at his home in Rochester early in March and is survived by a wife, daughter, mother and sister.

ON THE MAP AT LAST.

Buffalo has for several years been striving after free dental clinics for its poor children. At different times committees composed of dentists have been appointed, and after struggling for a time against the seeming inevitable, have lapsed into innocuous desuetude or died a natural death. Early in the autumn of last year it was decided by the members of the Oral Hygiene Committee of the Dental Society of the State of New York that the time was ripe to jump into the work and make one last determined effort. Accordingly the president of the Eighth District Dental Society, Dr. Abram Hoffman, was appealed to and he appointed a committee composed of himself as chairman, Dr. M. B. Eshleman, secretary; Dr. D. H. Squire, dean of the dental department; Dr. F. L. Dayment and Dr. J. W. Beach, members of the Oral Hygiene Committee. Organized effort was begun and through the assistance and influence of the late Edward H. Butler editor and proprietor of the *Buffalo Evening News*, the most powerful organ in Western New York, sufficient publicity was given the movement so that much favorable sentiment was created and public officials were obliged to sit up and take notice. Full co-operation was given the committee by the health commissioner, Dr. Fronzack, and by continued and concerted effort the city authorities were finally induced to approve of our request to establish two public clinics in schools and one central clinic in connection with the dental department. We are now struggling with the momentus and difficult questions of location, equipment, inspectors, operators, assistants, et cetera. We are much puffed up over our success, and feel very proud of our city in this respect, for we had felt much chagrin because there was such apparent indifference on the part of the authorities regarding the great need of the children of the poor for dental treatment. We can now look Toronto in the face without our brow mantling with shame.

The Relationship of Dentistry to Good Health.*

By W. D. COWAN, *D.D.S.*, REGINA.
Secretary Dominion Dental Council.

BEIEVING that through the medium of this paper we should try and reach the public as much as possible in language which they will understand, I have avoided as far as possible all technical terms and illustrations.

There are four things in connection with the dental inspection of school children and the relation of dental cares to general health which I would like to impress upon you. These I will summarize first and then give reasons.

1st. I submit that up to the age of two the child should be fed on an animal diet (milk chiefly).

2nd. That from the age of two or the eruption of the temporary teeth the mother should regularly clean the teeth of her child until the child can do it for itself.

3rd. That every child between the ages of six and eleven should regularly visit the dentist.

4th. That the only way to accomplish the third is for the various School Boards to compel it.

Regarding the first of these four I will say very little. The very young child does not come under the care of the dentists and the medical profession, therefore does not require any advice from us. Sufficient for me to say that all of the temporary teeth, and the crowns of all of the permanent teeth have been formed before the child is two years of age, and are lying in an unerupted state awaiting the time for eruption, therefore if we are going to build up a man or woman with strong, healthy bones, the food for this should be given at the time when that bone is forming. The erupted tooth depends to a large extent for its power to resist decay upon its density. Its density depends largely upon the foods supplied while the tooth is being formed, hence the necessity of animal or bone-forming food as distinguished from starchy substances at this period.

*Read before the Canadian Public Health Association, Regina, September 19th, 1913, and published in *Oral Health* by courtesy of *The Public Health Journal*.

It is amazing the indifference shown to dental defects; this particularly on the part of the mother towards her children between the ages of two and six. Dentally speaking easily ninety per cent. of the children have no mother at all at that age. These children don't need dentists half as much as they do mothers. The great bulk of parents think (and say), "Oh, well, these are just Mary's first teeth; she will lose them in a little while, so what is the use spending money upon them." The dental profession don't want her money. All we want her to do is to spend five minutes of her own time twice a day cleaning the teeth of her own child. I will venture the assertion that there are not twenty women in Regina who ever cleaned the teeth of that "little darling" that she would give her life to save. She will wash five dresses, if necessary, a day just to keep the little "sweet-heart" clean, but as for the teeth, why she "never thought of it." What we want her to do is to get a soft, small brush, and between the ages of two and six, when the child doesn't know enough to do it for herself, clean the teeth for her. Thousands of children have temporary teeth decayed until they are a positive menace to health. Why? The cause of decay is just the same in temporary teeth as in the adult, viz., fermentation resulting from uncleanliness. The result of uncleanliness and fermentation is just the same in the temporary teeth as it is in the permanent teeth, excepting that in the child it is far more rapid and disastrous. Why is it more rapid? Because the temporary tooth is almost all pulp (nerve); a thin bony wall covering a big mass of soft pulp; hence a slight decay is all that is necessary to produce death of the pulp. What then? Well, there will be at least one, and I have often seen a dozen fistulas discharging pus into the mouth. The child doesn't know it, for now there is no pain. The mother doesn't know it, for she doesn't understand the case. It all happens unconsciously, but what does happen is this. Every movement of the masticatory muscles forces some pus into the mouth. Every bite the child makes upon that dead, decayed tooth sends some more out to be swallowed. Just as we Canadians sprinkle sugar upon our porridge, so do these innocent youngsters mix in pus. If I handed you a quarter teaspoonful of pus and told you to swallow it you would get sick at the thought. Dozens of children right here in Regina are doing it every day. Poor kids. They do not know what they do. But they soon will. As to the effect upon the stomach of that child, I leave that with the medical profession.

The pus gets to the stomach, and we dentists know it. It comes from neglected temporary teeth, and we know it. It causes temporary derangement of the stomach, and we know it. In thousands of cases we have seen marked improvement in health as soon as the cause was removed. But it is not the stomach alone. An infected area exists through which every particle of air which reaches the lungs must pass. The germ theory is no longer a theory. It is a proved condition. Apply your knowledge of this condition; carry it into the lungs of that infected child, and what have you got? Disease, of course. Not only that, but the blood as it comes up to the lungs to receive oxygen, gets what? Just exactly what you would get of every ill-kept back yard. The only difference is that you are dead sure you are getting it in this case. Most of us clean up our back yards once in a while, but by neglect or ignorance we maintain a back yard in the mouths of our children to foster the breeding of trouble-creating germs, and then we scold these same youngsters because they won't be happy.

The stomach, the lungs, the blood, a pretty good trio to take better care of than we often do, and a bad trio to infect.

Then, again, these temporary teeth should not be extracted if it is at all possible to avoid it, because to do so is to help along a somewhat regrettable process of evolution. It is conceded that the dental arch is gradually becoming narrower, and our appearance as a human thereby improved. It is said that this process of evolution was started when mirrors were invented for our lady friends. It is also said that the more civilized, the thinner the face and the narrower the arch. Be that as it may, the fact remains that the teeth have not lessened in size in proportion to the narrowing of the arch. The result is an overcrowded arch, with increased proneness to decay. Now, by extracting the temporary teeth too soon, this process of contraction is individually hastened. Result, mal-occlusion, non-occlusion, retrusion, protrusion, and unsightly irregularities and decay. In many cases it takes years to bring the effect, but it comes just as surely as the years do. Nature has provided a way for getting rid of these temporary teeth, and that is the best way. Through our indifference we are turning nature right upside down. Nature provides for the absorption of temporary teeth from the end of the root down to the crown. We are trying to rot them out from the crown to the root, and it is a pretty rotten game we are playing. We are a

pretty big factor all right in helping to make this world revolve, but we can't beat nature. We will succeed better by buckling in and helping her along in her own way. What would I do, for there is no use denouncing without supplying a remedy? Well, we dentists seldom see these children under six years of age. The harm by that time is largely done. The school boards can't very well reach these, for they can hardly be called of school age. The only people we can reach are the parents, and we can only reach them by those who come in contact with them. Here at least I think the medical and dental professions can agree to unite. I wish that every medical practitioner would add another page to his prescription pad and give it to the mother at the final attendance at child birth or at some time during family attendance. Impress upon the mother the necessity of buying that soft, small brush I have already spoken about, and spending that five minutes twice a day cleaning the little kiddie's mouth, *and when she observes decay anywhere then take it to her dentist.* The little kiddie is worth it. Cleanliness will work wonders. In asking the medical men to do this I don't want to shirk any duty, nor do we dentists want to shoulder any responsibility upon the medical profession. The fact is that the medico is in the home and we are not. They can reach them at the right time and we can't.

I said that every child between the ages of six and eleven should be taken regularly to the dentist. Why? Because at the age of six the permanent teeth commence to erupt, and the first of the permanent teeth erupted are the most important teeth in the mouth, and at the same time are the ones most prone to decay, and the most misleading in their character. Almost every mother makes a blunder over the six-year molars of her children. At about eight years of age she brings the child to the dentist to have some aching "baby teeth," as she terms them, extracted. We dentists know by long experience before we see the teeth that she is clean wrong. It is the most common thing we have to deal with. She is told that they are not "baby teeth," but permanent teeth. "Oh! no," she replies, "Jack never had any teeth there." That is quite true, and yet they are permanent teeth she wants out. To take them out is disaster of the worst kind. Once they are gone, then in the subsequent eruptions the entire dental arch is disarranged. None of the teeth thereafter will occlude as they ought to. Shortly the four twelve-year molars erupt, and every one of them is out of place and tilted so that the grinding is done on the distal

wall instead of on the grinding surface. The interdental space takes on an abnormal shape and the lodgement of food is made easier. Fermentation is increased, decay furthered. Meanwhile, absorption of the alveolus is proceeding where the six-year molar was removed. This denudes the root of the second bicuspid. Shortly it becomes sensitive and loose. The final result: the three most important teeth in each jaw on each side have been lost, the beginning being that neglected six-year molar that the mother thought was a baby tooth and neglected. Now do you see why we want those youngsters to be taken to a dentist at the right time? It may take from five to ten years for it all to happen, but it will happen just as surely as the first tooth was lost. And when it does happen it will take just about one week or less to start a good dose of indigestion. There is more education for some people in half an hour of indigestion than there is in a week of such articles as this, but we don't want our youngsters to be educated in that way.

There are a hundred more reasons just as apparent as the one cited, why the child should be taken to the dental office between the ages of six to eleven, but time will not permit. The rapidity with which decay progresses in the child's tooth alone would prove the necessity. But how are we going to bring the child to the dental office? They won't come of their own accord. The parents won't send them. It seems to me that the only thing to do is to get the school boards to provide a proper dental inspection and compel a proper dental treatment in the interests of all concerned. If a child is contagion to himself, he is most probably a contagion to others. Have the others not a right to protect themselves, and is it not the duty of the state to protect a child against the ignorance of its parents? When I say ignorance, I mean a state made necessary by the fact that we cannot all be experts on all subjects. Ah! you say, some men may object to their child being forced to receive dental attention. My answer is that we find ignorance the world over. We always have to fight it. There is no use monkeying with ignorance. To leave a man in ignorance may be to leave him in a state of bliss, but ignorance and bliss and odontalgia and pulpitis and dyspepsia and indigestion are not quite one and the same thing, so that you are doing him a kindness by knocking the ignorance and the bliss and the dyspepsia out of him, even if you have to do it by force. As I have seen it, a health officer or any body having to do with the enforcement of laws made to promote public health, has

either to be a Czar or a failure. He can take his choice. Personally, I would sooner wear a Czar's crown and be shot on duty than be kicked out of the back door as a failure. Criticized! certainly. Every dad whose youngster has been whipped at school wants to go and lick the teacher. There are two thousand people in Regina who can run a dental office better than I can. Every man who has been compelled to close a condemned well has been "drinking that water and micro organisms for forty years and it never did him no harm." We all know these things. Science just smiles at them and bides her time. Criticism be hanged. It is the honest God's truth, and the stubborn facts as revealed by present-day science that we want. These must govern and the ignorance and stubbornness and criticisms must not be allowed to stand in the way.

Our Regina School Board has made a commendable advance in this matter. We have an inspection by nurses competent to determine whether or not dental services are necessary. It has already had the effect of securing to many children the benefit of skilled attention. The system gives every indication of being a success. It may be held that we favor it because it increases our practice. It may, but when we agree to do in return such charitable work as the nurses may indicate, then I think we can hold that the accounts balance. The balance being made, than I am at liberty to say that, after all, the greatest profit to be considered is the increased health of the child.

In conclusion, just a few quotations to show that eminent men agree on the importance of the subject herein discussed.

Sir Frederick Treves.—"Everybody seems to be on a diet. If people were a little more careful about their teeth, they would not need to be so careful about their diet."

Professor Osler.—"If I were asked to say whether more physical deterioration was produced by alcohol or by defective teeth, I would unhesitatingly say defective teeth."

Geo. Edwin Hunt, M.D., D.D.S.—"Most infectious diseases are more readily contracted through the mouth than by any other portal of entry to the body. Children with carious teeth and diseased gums may readily harbor the organisms of any specific disease, and, while not ill themselves from that disease, may be perfectly capable of communicating it to others."

Just a few statistics:

In Brookline an examination of the school children showed the following dental condition: The teeth of eighteen per cent. of the children were in good condition, thirty-one per cent. were in fair condition and fifty-one per cent. were in bad condition. In Lincoln, five per cent. were good, thirty-six per cent. fair, and fifty-eight per cent. bad. This is about the proportion you will find all over America. In many cases adenoids and enlarged tonsils are found as a direct of bad conditions of the teeth.

Wherever the inspection of school children for dental defects has been inaugurated a very marked benefit has resulted. It has been proved by careful observation and the collection of data bearing upon the subject that the children who were treated for dental defects soon became much brighter and better students and scholars. There is no question about it, a child physically unfit (even though there is no acute pain) cannot get the mental grasp that he or she would were the conditions normal instead of sub-normal.

Dental Inspection in Public Schools of Providence, R.I.

By JAMES C. COLTON, D.D.S., DENTAL INSPECTOR OF SCHOOLS.

DENTAL inspection of school children as established in Providence, R. I., will be of interest to all communities not within reach of dental colleges or provided with free clinics. Where colleges or clinics are established the question of corrective or preventive treatment for the children of the poor following inspection in the schools is not a very difficult problem, but where no means of treatment is at hand experience has shown that many children are unable to obtain even temporary relief from suffering due to dental disease.

It was with the hope of bettering the dental condition of all classes of school children that Providence adopted its present method of dental inspection. No clinics were at hand, and the hospitals offered only extraction as a means of relief for dental suffering.

In January, 1911, Dr. Charles V. Chapin, Superintendent of Health, appointed the first dental inspector for the public and parochial schools of Providence, the duty of said

inspection being to examine the teeth of school children and notify parents of all diseased conditions found.

The method of inspection is as follows: Children of the first and second grades are called to the school office, or teachers' retiring room, as the case may be, in groups of five; each child brings a paper upon which is written name, age and grade. This information is taken by an assistant and recorded upon the official examination slips, after which each child is examined by means of steel-handled mirrors and prober if necessary. All dental defects are recorded and the treatment deemed advisable by the inspector is indicated.

The need of dental inspection was forcibly expressed by a dental examination of primary, grammar and high school pupils of Providence, which revealed the fact that over 96 per cent. of the children of our city had defective teeth, and that 46 per cent. were suffering from aching teeth which were receiving no attention. So apparent was the need for action that when dental inspection was decided upon as a practical weapon, there arose the most difficult question of where to look for a point of attack. As stated, no means for corrective treatment was at hand, and only 4 per cent. of the children examined had ever received dental treatment. Dr. Chapin decided that as preservation of deciduous or temporary teeth was impossible under existing conditions, efforts would best be applied to preservation of the permanent teeth and preventative education, to best accomplish which it was decided to direct all efforts to those grades wherein would be met children of an age whose first permanent molar teeth had not had time to become diseased or, at any rate, not sufficiently so to necessitate extraction. Had dental inspection accomplished no other result, it is a success, for through it parents and children are being educated to the value of the first permanent or commonly called six-year molar.

But other results are being accomplished, as is shown by the returns presented by the assistant, to whose efficient service much of the success of the work must be credited. Under salary as a substitute teacher in the employ of our school department, this assistant spends regular school hours throughout the year in following up the children examined. This work is most important, for thereby parents are not permitted to forget, after attention has once been called to the dental defects of their children. Reports show that last year 3,594 children were examined, of whom 3,242

(90 per cent.) had defective teeth. Returns at hand for 2,633 of these children show that 673 (25 per cent.) have been taken to the dentist for treatment, with the result that 2,571 dental operations have been performed—237 permanent teeth were filled, 225 temporary teeth were filled, 43 permanent teeth were extracted, 2,066 temporary teeth were extracted. A total of 2,571 dental operations.

It must not be lost sight of that these children are all in the first and second grades, and are of an age where temporary teeth are loosening. In many cases where loose teeth are present the children are instructed to have them out at home. Records show that 698 children followed such instructions, and as no credit is taken for home extractions unless recommended and so indicated on the notification to parents, we must in fairness include these children as among those who have been benefited by the work of dental inspection. But regardless of where the credit belongs, the fact is undeniable that over 50 per cent. of the children in need of treatment have at least been given some relief.

Not alone have these children benefited because of dental treatment; they have also been taught the value of clean, well-cared-for teeth, and were statistics taken to-day in the schools where inspection applies, no such condition of neglect as shown by a former examination would present. And parents who formerly permitted the permanent molars to decay, believing that they would later be replaced, are now exercising every effort for their preservation.

In order that the children of the poor might receive treatment, the members of the Rhode Island Dental Society practising in Providence established a board of "clinical dentists." Membership on this board was entirely voluntary, the men agreeing to work for children (officially recommended as being in need of assistance) at a very nominal fee, such work being done in the private offices of the members of the board. To the generosity of these men much credit is due for the success of the work, as only through them can many children hope for relief. Illustrated talks on dental disease and mouth hygiene are given frequently to parents' meetings held in the primary schools as well as to the grammar children who are not included in the grades examined. By means of such talks parents and children are aroused to a higher appreciation of dental care. Personal appearance is a big factor in the fight for success, and there is no greater embarrassment to personal appearance than diseased and unclean teeth. That clean, sound teeth are a business asset I am sure none will deny.

Dental inspection in Providence attempts prevention as well as correction of dental disease by appealing to children at a time of life when they are most apt to regard teeth brushing as a waste of time better applied in cultivating their youthful fancies.

Health and Rural Schools.

CITY public schools have taken an advanced position in relation to the health of the pupils. The matter of good health and hygiene has come to be regarded as of first importance in the development of the child.

It is most important that the good health propaganda be extended to rural schools as well. A prominent Minnesota physician has been making a personal canvass of the rural schools of that State investigating health conditions in these schools. He finds some astonishing and alarming conditions. Forty per cent. of the children, he asserts, suffer from "almost constant" toothache; 19 to 23 per cent. have frequent headaches. From 12 to 14 per cent. of the country school children suffer from earache, and 4 per cent. have discharging ears. Adenoids, earache, discharging ears, deafness—that is the order found over and over again. Four or five per cent. of the children simply do not hear what is going on and are therefore put down as stupid, when they are not.

This investigator found that 80 per cent. of the children drink coffee. Nearly all of them have tooth brushes, but few responded affirmatively when he asked if they had used them "this morning." According to his report, many of the children assumed that headache, earache and other ailments were perfectly natural things, and seemed surprised that anybody should be curious about them. "Why, I always have headache," they would say. It was learned that by simple questions about the children's eyesight, the teacher, without any optical tests at all, would discover that 20 per cent. of her children suffer from eye strain.

The children were well fed, though it was found that they do not eat the right kinds of food. Country people frequently exclude the air from their houses by keeping the windows closed tight, and the commonest principles of hygiene are often neglected. In one school visited an old-fashioned unjacketed stove had sent the thermometer to the sizzling height of 90 degrees, while it was 10 below zero

out-of-doors, a difference of 100 degrees. The same sizzling stove might be found in nine out of ten rural schools.

The point is that there is not the slightest reason to be given in excuse of barnlike school houses. There isn't the least reason why children should suffer from eyestrain in a rural school. There is no excuse for ignorance of the fact that one child is falling behind because of bad eyes, bad teeth or adenoids. We in Canada are entirely able to remedy all this wherever it exists. We are coming upon better times for school children. Some day the provinces will watch children's diseases as carefully as they now do hog cholera.

How to Hold Cotton on a Smooth Broach.

CHERE is one point in technique with reference to the treatment of pulp canals which I learned on a trip to New Orleans, a point I consider well worth the expense of the trip a great many times over. It had been my custom to dry pulp canals by twisting cotton fibre upon a spiral broach. Occasionally it was almost impossible to get the cotton off of the broach, consequently I lost much time. I tried many times to use a smooth broach as an applicator for medicaments, by twisting cotton upon the broach, but I could not get it to hold. For instance, when I wished to apply a drug in the canals and pump it down towards the ends of the roots the cotton would become loosened. It is an easy matter to attach cotton to a smooth broach, and all there is to it is to draw the smooth broach across a piece of sterile beeswax before twisting the fibre upon the broach. Any amount of cotton may be firmly attached to the broach, and it will not become loosened in pumping the drug into the canals. That little point in technique has saved many hours of time for me. It has materially assisted me in drying canals because I am enabled to use a smooth broach of extremely small diameter and twist a few, or as many fibres as necessary upon it, and come more nearly approaching the apex of the roots with the dry cotton fibres in drying the canals than by any other method.—*Carl D. Lucas, Indianapolis, Ind.*

The Docker's Toothache.

Toothache is very prevalent amongst the men employed at the docks, and the remedies suggested, and very often used, to cure the evil are many in number and weird in quality. There are some well recognized, and old established cures of course, such as forcing a plug of tobacco in the cavity of the offending molar, but this has been so often made an excuse for obtaining a "chew" of tobacco from somebody else that no one thinks of recommending it to a suffering comrade. Rum is also recognized as a very useful remedy, but the same disadvantage applies here. So other remedies are fallen back on. One such is a few strands of tarry rope. Tarry rope is plentiful and costs nothing to the man who prescribes it, and is consequently in favor. Put a piece of tarry rope in the hole, mate," says the adviser. "There ain't no hole in it," says the sufferer. "Then you haven't got toothache," says the adviser. "You only think you have." Nothing will induce these men to have a tooth extracted. In the course of their daily work they run considerable risks and often receive injury, but this is all accepted as a matter of course, but the thought of being "operated" on appals them. In the neighborhood of the docks on Saturday nights street vendors are much in evidence, and the "pill doctors" and the "dentist" do a good business. The modus operandi of the last-named worthy is to extract teeth free for anyone who is willing to be practised on in order to collect an audience. The docker, who has complained of toothache of late, shuns this gentleman's rostrum, should he approach it he will be haled forward by his mates. Toothache, according to this wizard, varies in intensity and staying power. He will sell you a cure for sixpence that will cure the pain, or another cure for a shilling which will not only cure it, but keep it away for the future. "It burns out the microbe," he says, and men and women who can read and write and who possess normal intelligence, patronize him. Sometimes an interruption occurs. A docker has purchased the permanent cure and found it wanting. "Did you buy it from me?" asks the quack. "Look at me again—take particular notice of me. There are imposters about." The man adheres to his statement. "Then your teeth ain't normal," says the fellow. "One person in every five hundred is what the medi-

cal books call abnormal. You'll suffer at intervals all your life. Come up here and I'll take all the bad ones out for you," and the offer always succeeds in driving the interrupter away. The cold winds are popularly supposed to be responsible for the prevalence of toothache in this part.—*The Dental Record.*

Toronto Dental Society.

OFFICERS of the Toronto Dental Society for the ensuing year have been elected as follows: Hon. President, W. E. Willmott; President, G. W. Grieve; First Vice-President, F. C. Husband; Second Vice-President, E. F. Arnold; Secretary, W. A. Black; Treasurer, J. E. Rhind.

National Dental Association.

TENTATIVE PROGRAMME.

CHE National Dental Association will hold its 1914 meeting in Rochester, N.Y., July 7th to 10th. The House of Delegate will hold its first session on Monday, July 6th, at 11 a.m., and it is important that all delegates be present at this time.

The first General Session will open at 11 a.m. Tuesday, July 7th, and the local committee have hopes that Gov. Glynn will be present to make the address of welcome. This will be responded to by Dr. S. Holly Smith, Baltimore, Md. The President's address will be followed by an address by Dr. Victor C. Vaughn, President of the American Medical Association.

The second General Session will be held in Convention Hall at 8 p.m. Tuesday, and will be a symposium by the Research Commission with Drs. Weston A. Price, Thomas B. Hartsell and Russell W. Bunting as speakers. At the Wednesday evening General Session Dr. Joseph C. Bloodgood, M.D., of the John Hopkins University, will discuss "The Early Recognition of Precancerous Lesions of the Mouth and Tongue." At the Thursday evening General Session two selected papers will be presented from Sections 1 and 111.

The programme for the section meetings has not been entirely completed, and two or three papers will be added to the following list: Dr. J. R. Callahan, Cincinnati, "Some

Phase of Root Canal Treatment"; Dr. W. H. DeFord, Des Moines, "Some Phase of Eliminating Pain"; Dr. E. J. Eisen, Milwaukee, "Dental Radiography"; Dr. Herbert L. Wheeler, New York City, subject to be announced; Dr. Fred W. Gethro, Chicago, subject to be announced; Dr. J. D. Patterson, Kansas City, "Pyorrhea Alveolaris"; Dr. C. H. Oakman, Detroit, "Oral Hygiene"; Dr. Chalmers J. Lyons, Ann Arbor, "The Pathological Significance of Impacted Teeth"; Dr. Dayton Dunbar Campbell, Kansas City, "Some Basic Principles and Methods in the Reproduction of Mandibular Movements"; Dr. Wm. A. Giffin, Detroit, "Technique for Making Impressions and Models for the Construction of Artificial Dentures," demonstrated with motion pictures; Dr. A. J. Bush, Columbus, "Classification of Fixed Bridge-work with Law Governing its Application"; Dr. Carl B. Case, Milwaukee, "Evolution of Root Movement"; Dr. Jules J. Sarrazin, New Orleans, "Properly Constructed Bridges and Their Hygienic Care"; Dr. Homer C. Brown, Columbus, "The Responsibilities of the State Society Officers"; Dr. Otto U. King, Huntington, "The Business Side of the State Society Work."

The Clinic Committee is to present a Progressive Clinic Wednesday morning commencing at 9.30. They have secured a list of exceptionally high-class clinicians for both the Progressive and the General Clinic. The General Clinic will be given Friday morning and full details of the clinical programme will be presented through the National Bulletin and later journals.

The local committee has selected the Powers Hotel as headquarters and reservations should be made as early as possible. A full list of hotels and rates will appear in the National Bulletin. This committee has made ample provisions for a large meeting. All except the evening General sessions will be held at the Exposition Park under most favorable conditions. The superintendent of the park has assured us that the temperature of these buildings can be regulated so that July weather need not interfere with our comfort.

All reputable practitioners of dentistry and medicine are cordially invited to attend this meeting.

Fraternally,

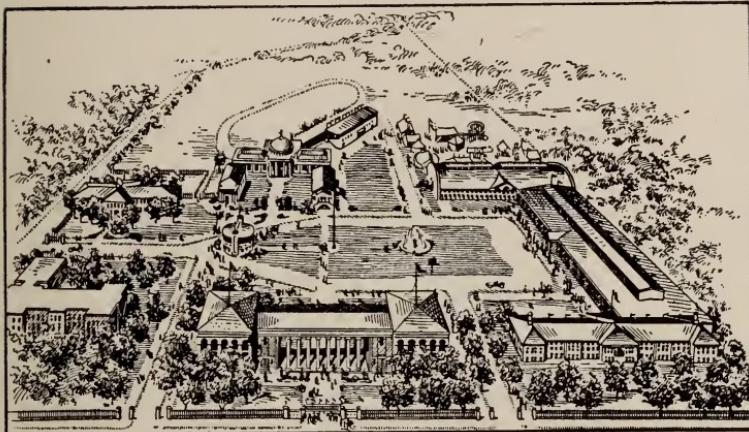
OTTO U. KING, Gen. Sec'y., HOMER C. BROWN, Pres.
Huntington, Ind. Columbus, Ohio.

An Invitation

is tendered to every ethical dentist in the Dominion of Canada to attend the

National Dental Convention,

July 7th, 8th, 9th, 10th, 1914.



Bird's Eye View of Exposition Park

CHE local committee are planning to hold the meeting in Exposition Park with its beautiful lawns, its large airy courts and all of those conveniences that mean so much in the warm summer months.

All of the buildings in which the assemblies, clinics and exhibits will be held are large, scientifically ventilated and mechanically cooled.

There will be no crowding, no hot pavements; and assemblies, clinics and exhibits will all be held in adjoining buildings.

Make reservations now and bear in mind you can secure better rates in all of our hotels where two or more occupy the same room.

Write any of the following: *Powers Hotel, *Hotel Seneca, *Hotel Rochester, *Hotel Hayward, Whitcomb House, Hotel Eggleston, New Osburn House, Hotel Bristol, Clinton Hotel.

Local Committee.—Edward G. Link, Chairman, 226 Cutler Bldg., Rochester, N.Y., William W. Smith, Benedict S. Hert, Louis Meisberger, Charles L. Brininstool.

*Denotes first-class hotel.

Dr. Cummer's Post-Graduate Course.

CHAT post-graduate instruction has become a necessity to the progressive dentist has been demonstrated by the interest manifested in the course in Dental Prosthetics to be given in Toronto, under the direction of Dr. W. E. Cummer during the first two weeks of September. Comments have plainly shown this need of the busy and successful practitioner, whose opportunities for becoming versed in the remarkable developments now taking place in dentistry, especially the prosthetic side, are confined to magazine reading, text-book reading and attendance of conventions. These are good in their way, but lacking the continuity, personal contact and opportunity for question and exchange of ideas possible only in post-graduate class work. The medical profession, who, it must be admitted, are the great educators in the matter of public health, to-day, are very keenly alive to the defects, mechanical and sanitary, of some of the so-called modern dentistry of a short time ago, especially many of the fixed bridge forms of replacement; and the older graduate in many cases finds himself in competition with the younger graduates, lacking in many respects, but with a working knowledge of up-to-the-minute dentistry of this type. The course above mentioned is designed to fully equip the older graduate to meet these conditions in their every variety. Regarding Professor Gysi's fundamental work in anatomical articulation, the writer found that he received more knowledge and handcraft from three days instructions under Professor Gysi than three years and a half careful study of the printed matter on the subject. He has proven to his own satisfaction in practice the simplicity and comparative ease with which an apparently complex theory and apparatus may be used, and has been struck repeatedly with the numerous advantages to patients wearing dentures constructed on these lines. Dr. George H. Wilson's course is outlined as follows:

1. Plaster of Paris.
 - (a) Physical Properties.
 - (b) Theory of Setting.
 - (c) Principles Involved in its Use.
 - (d) Uses Demonstrated.
 - (e) Spence Plaster Compound.
 - (f) Impressions—Classification and Demonstration of Modern Methods for both Plaster and Modeling Compound.

2. Rubber and Vulcanite:
 - (a) Physical and Chemical Properties.
 - (b) Theory of Vulcanization Elucidated.
 - (c) How to Manipulate for Best Results.
3. Retention of Artificial Dentures:
 - (a) Principles Discussed.
 - (b) Methods Demonstrated.
4. Esthetics:
(Illustrated with Lantern Slides.)

As previously stated, the successful forms of removable bridge prosthetic pieces, including the Roach, Gilmore and other attachments, will be demonstrated in sufficient variety and with one of the largest collections of models of that variety in America as will be expected to give the members of the class a working knowledge of the principles, both from a chairside and laboratory standpoint, to enable them to deal successfully with any case which may present.

Dr. Wallace Seccombe, whose efforts for a considerable length of time have been directed along the line of examination into the problem of cost keeping and its relation to the business side of dentistry, has prepared a large amount of information bearing upon the determination of costs which will be presented to the class. This is considered invaluable to the practitioner who conducts his affairs upon a basis which affords justice to the patient as well as to himself.

In brief no effort will be spared to make for those who grasp this opportunity two weeks packed from beginning to end with all that is new (and not untried) in prosthetic dentistry.

An Opportunity for Canadian Dentists.

By GEORGE WOOD CLAPP, D.D.S.
Editor, *The Dental Digest.*

WHEN Professor Gysi came to America last year and taught his principles of articulation, Professor Cummer, of the Royal College of Dental Surgeons, was one of the first members of the profession to enroll his name as a student. It is doubtful whether anyone came to the work of the class better fitted by previous experience and inspired by deeper interest than did Professor Cummer.

He made the most of his association with Professor Gysi, both in the class-room and outside, and left New York feeling that his mastery of the subject of articulation had been greatly extended.

During the months since the Gysi Classes, Professor Cummer has utilized what he learned by applying it to his own experience and by teaching it to others. The interest in this work has so extended itself that arrangements for a two weeks' study course in dental prosthesis under Professor Cummer has been arranged for practitioners and instruction will begin about September 1st. The course covers the examination of the mouth, the determination of the form of mechanical restoration necessary and the esthetics and mechanics of making a suitable restoration, with a wealth of detail which will be very profitable to practitioners attending.

There will be at least thirty-six clinics, and extensive preparations have been made for teaching each subject in the most effective way.

I believe the Canadian dentists are, on the whole, more intelligent than we are in the States concerning the cost of conducting practice, but I am glad to see that the economics of practice, the keeping of costs and the arrangements of the several parts of the office will be considered. He will be a dull student indeed who does not find this course profitable.

Courses such as this are becoming very common and are generally very profitable to the students therein. Sometimes they are conducted for private gain, in which case any publicity they receive from this magazine must be through the advertising columns, at their own expense. Sometimes they are conducted for the good of the profession, with no thought of private gain, as in the cases of Dr. Engstrom at Los Angeles, Dr. Hergert at Seattle and Professor Cummer's course at Toronto. And in such cases, I am very glad to aid them.

Practitioners are being brought to realize the need of such courses by experience. Those of us who were graduated from college a number of years ago weren't taught the methods now seen to be best. The younger dentists come into the community and make better dentures and bridges and inlays, and pretty soon a few of our better patients become their patients and we begin to be regarded as the representatives of a generation that is past. And that is pretty nearly fatal.

Practitioners in America, as a whole, don't know anything about office costs, or economies of time and arrangement. They know enough about hard work and worry. They are making their own families pay bills that patients should pay. And the patients are away somewhere having good times on the money that should buy either necessities or luxuries for the dentist's family.

I hope Professor Cummer's course may be well attended. I am sure it will be profitable to all who enroll.

Amendments to British Columbia Act.

CHE British Columbia Dental Act was amended slightly during the closing hours of the last session of the B. C. Legislature. Some of the changes are as follows:

The Lieutenant-Governor has the appointing of the five examiners each year. He also will keep the papers of the candidates in his possession and they can be seen at any time. The Board of Examiners must give an examination twice a year in June and November as before, and also when asked must hold a special examination for any candidate, the cost of which examination is not to exceed \$200.00.

The Act also defines very clearly just what constitutes the practice of dentistry. This will be a great help when making prosecutions of unlicensed men as the B. C. courts have always had some doubt as to what constituted the practice of dentistry in British Columbia.

At the annual meeting of the British Columbia Dental Council a British Columbia Society was formed and will consider during the year the question of Dominion Registration. The next meeting is to be held in Vancouver during February, 1915. A committee was appointed to report on the Dominion Dental Council.

Eastern Ontario Dental Association.

CHE 37th annual meeting of the E. O. D. A. will be held at Cornwall (Stanly Island) on Wednesday, Thursday and Friday, June 24th, 25th and 26th next. The programme as arranged at this date is as follows:

WEDNESDAY, 8.30 P.M.

President's Address and Election of Officers.

THURSDAY, 9 A.M.

Paper.—Subject to be selected. Dr. J. Alex. Armstrong, Ottawa.

Discussion by Dr. A. T. Morrow, Maxville.

Paper.—The Use and Abuse of the Cast Gold Inlay. Dr. R. H. Cosgrove, Ottawa.

Discussion by Dr. McIntyre, Ottawa.

THURSDAY, 2 P.M.

Paper.—The Leger Dorez System of Split Ferule Crowns and Interlocking Bridges. Dr. Nolin, Montreal.

Discussion by Drs. Cavanagh, Davy and Greene.

THURSDAY, 8 P.M.

Entertainment by the local dentists.

FRIDAY, 9 A.M.

Paper.—Our Prospective—What Are We At and Who Are We? Dr. M. F. Cross, Ottawa.

Discussion by Dr. M. G. McElhinney, Ottawa.

Paper.—Every Day Office Complications and How to Overcome Them. Dr. R. Milton Armstrong, Ottawa.

Discussion by Dr. W. R. Winters, Ottawa.

FRIDAY, 2 P.M.

Report from Dr. Davy the District Representative.

Report from Dr. A. A. Smith, Representative to the Canadian Dental Convention.

Tubercular Patient--Neck Fractured During Extraction of Teeth.

AYOUNG man of twenty-two years, Insurance Clerk, was administered nitrous oxide gas by a dentist in Kentish Town, England, for the purpose of the extraction of teeth. The dental surgeon extracted one molar tooth and was about to extract another when it was noticed that the patient had difficulty in breathing.

Artificial respiration was resorted to, but death is reported to have occurred twenty minutes later.

Dr. B. H. Spilsbury, Pathologist of St. Mary's Hospital, who made a post-mortem examination, said there was tubercular disease of the upper part of the neck and skull, whilst a portion of the bone in the neck had become detached.

The fourth vertebra of the neck, he found, had been fractured, and this had caused death. Owing to their soft condition and the disease of the bones of the neck, he said, any slight jerk or force would cause such a fracture.

The administration of the anesthetic took no part in causing death.

The jury returned a verdict of "death by misadventure."

Children's Teeth and Good Health.

CHE Medical Officer of Health for the City of Toronto has published a Health Bulletin bearing particularly upon health problems incident to the development of babies and young children. This bulletin contains much general information of value. Upon the dental phase of the question the bulletin points out that "when the teeth finally make their appearance, the diet of the child, as well as the habits of mastication and mouth health, must be looked after.

"The question of diet is to be considered in its relation to tooth development and preservation of the teeth. Artificial foods generally contain too much sugar and as a rule are a menace to the teeth in the mouth.

"Candies and sweets should be indulged in only at meal time, and immediately after the meal the mouth and teeth should be thoroughly cleansed with plenty of water and a good tooth brush.

"The prudent mother will care for the first little tooth, clean it and polish it like the precious jewel that it is, and, as others appear, the field of operation will widen until a whole field of gems is included. If the mother forms this habit in the young child, it will in all probability keep it up during a lifetime. The teeth should be brushed from the gums to the biting edge, both inside and outside, using plenty of water for rinsing purposes. They should be brushed after each meal, before retiring and upon rising in the morning.

"A clean mouth—what does it mean to the child? It means thorough mastication, proper nutrition, physical and mental development, freedom from toothache and the resulting eye strain and nervous disturbances, clean, sound, regular teeth, a barrier against disease germs, increased self-respect, and that pure food will not be contaminated in an impure mouth."

A Useful Device.

CO avoid the adhesion to instruments of such materials as cement and gutta percha, take an ordinary vaseline pot with a well-fitting metal screw top, cut a hole in the lid about the size of a florin, fill the jar with cotton wool soaked in oil, in such a manner that it stands up like a pin cushion above the rim of the lid; cover with a piece of buckskin firmly fixed by means of a piece of string or thread. An instrument drawn across the cushion will take up enough oil to prevent the adhesion of materials without becoming inconveniently oily.—*From the Zahntechnische Rundschau.*

Use of Eucalyptol.

CHE use of eucalyptol is indicated in root canal work for many reasons:

First.—It will displace moisture, because eucalyptol has a great affinity for dentin.

Second.—It is a slight solvent for gutta percha and causes the gutta percha to adhere to the wall of the canal.

Third.—It is a lubricant, making it easier to force the gutta percha into small canals.

Fourth.—It is antiseptic.—*Dr. Fred Gethro, Chicago, Ill.*



PERSONAL PAGE

CHE Executive Committee of the Niagara Falls Conservative Association has endorsed the candidature of Dr. G. J. Musgrove as member of the Legislative Assembly.

A number of the 1914 graduates of the Royal College of Dental Surgeons have already established themselves in dental practice. The following men are among those who have located:

Dr. I. H. Ante is practising with Dr. Trotter in Toronto.

Dr. H. A. Chartrand has located in Ottawa.

Dr. J. H. Duff has secured the practice of Dr. Callum, 207 College St., Toronto.

Dr. B. R. Gardiner and Dr. L. H. Thornton have accepted positions on the staff of the McGill Dental College.

Dr. Hollingshead has opened an office in Brampton and Dr. Savage in St. Thomas, Ont.

Dr. Frank S. Spieres has purchased the practice of Dr. Howes, Regina. Dr. Howes has retired from practice.

Dr. W. D. Stevens has located at Athens and Dr. J. F. Sebben at Preston.

The following graduates will locate in the city of Toronto: Drs. Watson, Ward, Scott, O'Brien, Kruger and Coveyduc.

The many friends of Dr. Wilcox, of Toronto, will be sorry to learn that his health has compelled him to retire temporarily from active practice.

Dr. McGregor has opened an office at Little Current.

Dr. J. I. Kelly has secured the practice of the late Dr. Mills of Calgary.

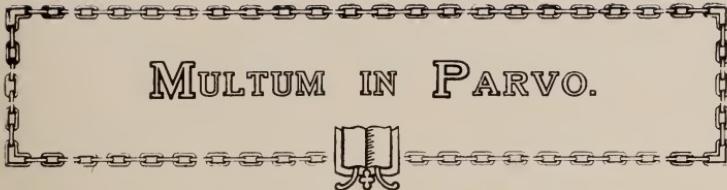
The Health of School Children in England.

THE annual report, for 1912, of the Chief Medical Officer of the Board of Education, which was recently issued, contains an exhaustive account of the measures which are being taken throughout England to safe-guard the health of school children. During the year which ended on July 31 last the schemes of medical inspection were approved by the Board and the school medical officers recognized in 303 out of the 317 local education areas, and in the remaining 14 areas medical inspection was also in operation. Altogether there were 1,111 medical officers in the school service in England and Wales, as compared with 943 in 1911; 82 were women and there were 742 nurses also engaged.

The report states that, speaking generally, it may be said that out of the six million children registered on the books of the Public Elementary School of England and Wales about 10 per cent. suffer from serious defect of vision, from 1 to 3 per cent. suffer from defective hearing, 1 to 3 per cent. have suppurating ears, about 10 per cent. have adenoids, inflamed tonsils, or enlarged cervical glands, requiring surgical treatment, about 1 per cent. have ringworm, 1 per cent. suffer from tuberculosis of readily recognizable form, from 1 to 2 per cent. are affected with heart disease, from 30 to 40 per cent. have unclean heads or bodies, and probably more than half the children are in need of dental treatment.

REPORT OF TWO DEATHS UNDER ETHYL CHLORID ANESTHESIA.—Leriche, of Lyons, reports two cases of death under ethyl chlorid. He attributes deaths from this anesthetic to impurities, the presence of which is not readily recognized. He advises slow and cautious induction of anesthesia when kelene is employed, and a liberal admixture of air. Allusion is made to previous statistics, which show ethyl chlorid to be two hundred times more dangerous than nitrous oxide.—*Revue Trimestrielle Belge de Stomatologie*.

“Every mouth its own articulator in the finis.”—Jacob Greene.



MULTUM IN PARVO.

This Department is Edited by C. A. KENNEDY, D.D.S., 2 College St., Toronto
Librarian, Royal College of Dental Surgeons of Ontario

*Helpful Practical Suggestions for publication, sent in by members
of the Profession, will be greatly appreciated by this Department.*

MENTHOL-PHENOL AS A ANALGESIC.—Three parts menthol crystals are melted together with one part phenol crystals. This is useful as an analgesic, when applied to an aching tooth with an exposed pulp or to a painful socket after tooth extraction. It has marked antiseptic properties, but is not disinfectant in the degree required for treatment of putrescent conditions.—*J. M. Howe, Dental Brief.*

THE CONTACT POINT.—I want to emphasize the importance of the contact point by relating a little personal experience. The contact point has been a great source of annoyance to me, not only in the filling of teeth, but in my own mouth. Some twenty years ago a very splendid and competent operator put in a gold foil filling in an upper first molar for me, and also one in the second bicuspid. By some force or stress I broke off the inner cusp of the second bicuspid and the filling was dislodged in that tooth, and I remember calling on one of my friends to restore the space with a crown. In making a crown for that space he could not restore the contact point which had never been there in those two fillings that had previously been inserted. But the crown was put on, and I went down to the Illinois State Dental Society at Springfield, and if there was anything that was annoying it was the interproximal space between those teeth. I was standing in the lobby with a silk thread, trying to dislodge the food from the interproximal space. The dentist who inserted the crown came along and asked what I was doing, and I said: "You have ruined my mouth." He said, "I will fix that for you as soon as we get back to Chicago." He took the crown off and made a contact point and replaced it, but he did not do it soon enough, so I have lost all the gum tissue in the interproximal space, and I am nearly in as bad condition as I was before, but if the two fillings had had proper contact points in the beginning there would have been no trouble.—*G. W. Cook, Dental Review.*

ORAL HEALTH.

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Vol. 4

TORONTO, JUNE, 1915.

NO. 6

EDITORIAL.

DENTAL ADMINISTRATION IN ONTARIO.

SO far as we are aware dentistry in Ontario is more advanced in the matter of control over dishonest unethical practice than in any other province or state in the world. The Ontario Legislature has reposed in the hands of the Provincial Dental Board large disciplinary power over the individual members of the dental profession.

The Ontario Board represents the dental profession in a very intimate and democratic way, its members being elected by the entire dental profession in actual practice in the Province. The Provincial Government has placed unbounded confidence in the profession, permitting it not only to elect the Dental Board, but also to exercise jurisdiction over the members of the profession in all cases where the interests of the public and profession require protection.

The Board of Directors of the R. C. D. S. has thus been able to maintain the dignity of its investigations and compel respect for its decisions. It represents, officially, the entire profession in Ontario, is the sole teaching and exam-

ining body in the Province, and has behind it the entire assets and resources of the Royal College of Dental Surgeons of Ontario and the authority of the Legislative Assembly of the Province.

Such a combination of factors places the dental profession of Ontario in a most favorable and quite enviable position of strength. These factors should be conserved and any suggestion looking toward a change in the administrative powers of the Board should be most carefully considered before any attempt is made to disturb present conditions.

* * * * *

CHE Discipline Committee of the college met at the College Building early in May and held an investigation into a complaint made against a licentiate for having, in his office, permitted a non-licentiate to practice dentistry and perform dental operations.

The evidence was taken under oath administered by the Chairman of the committee. The defendant pleaded guilty to the charge and admitted that he had been employing in his office, persons not legally qualified to practise. The defendant expressed regret for his past conduct and undertook in writing, that for the future he would employ none but duly qualified operators as assistants.

The committee reported its finding to the Board. The Board decided to suspend action until its next meeting for the purpose of testing the sincerity of the defendant's promises and undertakings. The defendant also paid all costs incurred in the investigation, as well as arrears of fees due the college in respect of the annual fee.

* * * * *

BECAUSE of the large powers resting upon the Board of Directors and the important educational and administrative functions reposed in the Board, every licentiate in Ontario should take a keen interest in the use of his franchise and elect to the Board men of experience, character and good judgment, that the important work of the Board may continue to be carried on successfully and in the best interests of the public and dental profession.

National Dental Association.

DR. HOMER C. BROWN, President of the N. D. A., has been kind enough to extend through ORAL HEALTH, a cordial invitation to all ethical dental and medical practitioners of Canada to attend the National Dental Association meeting, to be held in Rochester, July 7th to 10th. Strong active committees are at work and a good meeting is assured.

Canadians who attend the meeting will find it interesting to study the reorganization plan of the National Association and enquire as to its practicability. The local district and state societies have all been made auxiliary to the National. The annual membership fee in the local society is sufficient to enroll the local member in both the state and national organizations.

This plan is a great advance toward the complete organization of the dental profession. When the whole scheme is developed the dental profession will be able to move as a unit and national plans may be formed and worked out with the co-operation of the entire profession.

The Free Dental Clinics of Cincinnati.

REPORT OF OPERATIONS PERFORMED.

(During 1913 the report represents the work of six half-time operators.)

	1910 Sep.-Dec	1911 10 mths	1912 10 mths	1913 Jan.-July
Fillings	763	2564	1789	3952
Treatments	334	1335	1455	1720
Prophylaxis	192	515	476	1074
Crowns	3	10	8	8
Extractions	256	790	961	1555
Total Operations	1584	5214	4689	8282
No. of Cases	210	790	972	1379

It is better to prefer honorable defeat to a
mean victory, to lowering the level of
our aim that we may more certainly
enjoy the complacency of
success.—*John Ruskin.*



Frederick C. Husband, D.D.S.

TORONTO

ORAL HEALTH.

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION"
AS WELL AS THE "POUND OF CURE."

VOL. 4.

TORONTO, JULY, 1914

No. 7

**Dietetics.*

By F. C. HUSBAND, D.D.S., TORONTO.

CHE following is largely composed of excerpts from Horace Fletcher's "The A, B-Z of Our Own Nutrition." During man's progress upward from the anthropoid his diet has undergone a progressive change, and a parallel adaptation has taken place in his jaws and teeth. Dietetically considered, we may divide his evolutionary career into the following epochs:

1. Anthropoid stage.
2. Pre-cooking human stage.
3. The cooking pre-agricultural stage.
4. The early agricultural stage.
5. The late agricultural stage.

The Anthropoid Stage.—The diet of man's anthropoid ancestors was probably much the same as that of existing anthropoid apes; it consisted mainly of raw vegetables and animal food, necessitating a vigorous use of the maxillary apparatus. The jaws were massive and markedly prognathic. The denture was the same as it is in existing man, but the teeth were larger, especially the upper canines; the third molars were as large as the other molars and had three roots, and there was an ample portion of alveolar ridge behind them. There was no chin.

The Pre-cooking Human Stage extends from the time man's ancestors first assumed the human form till they learned to apply fire in the preparation of their food. During this period the jaws and teeth were used as much, or almost as much, as in the anthropoid stage. Raw animal

*Read before the Technique Club, Toronto.

food had to be torn from the bones, the latter had to be crunched, while the bulk of raw vegetable food needed then, no less than it needs now, prolonged and vigorous mastication in order to liberate the starch and other nutritive ingredients from their indigestible cellulose envelopes. The jaws and teeth underwent considerable change, being called into requisition for offence and defence, but became materially modified in co-relation with the expanding cranial cavity and in connection with the assumption of the erect posture.

The Pre-agricultural Cooking Period.—The character of the maxillary apparatus belonging to this period are still available for study, the aboriginal Australians, the Bushmen, Negritos and many Esquimaux not having yet emerged from it.

So far as mastication is concerned, cooking influences vegetable far more than animal food, for it not only softens it, but by rupturing the indigestible cellulose chambers and liberating their contents, relieves mastication of one of its essential functions, wherefore man's teeth and jaws began to get smaller and they have continued to diminish in size up to the present time. No great diminution took place at first, inasmuch as the diet still continued to be largely animal (and prior to the advent of knives and forks such food had to be torn by the teeth). The third molars show a decided tendency to be smaller than the rest. Dental caries is rare and is chiefly met with in the third molars.

The Early Agricultural Age.—All the existing primitive races which have attained to the cultivation of the soil may be regarded as belonging to this period. Previously to it man was mainly carnivorous, owing to the comparatively limited quantity of vegetable food available so long as the supply was left to nature alone; but when by cultivation this supply was increased and at the same time rendered more constant and certain, he gradually became less carnivorous and more vegetarian in his diet. The result of agriculture, however, is not only to increase the supply of vegetable food, but to diminish its fibrous cellulose ingredients and thus to render it more easily masticated, hence at this stage we find the maxillary apparatus becoming smaller than in the previous period, although the difference as shown by skulls of the African negroes and Melanesians is less pronounced, the jaws are smaller, also the teeth, especially the third molars, which now for the first time show signs of having only two instead of the three roots, while

the alveolar ridge behind them is distinctly shorter than in the previous period. Dental caries, hitherto rare, now become quite frequent.

The Late Agricultural Period.—That in which we ourselves live. The chief characteristic of the food is its softness. Cooked animal food requires, indeed, more mastication than raw, but the vegetable food of to-day, owing to the combined effects of improved agriculture and skilful milling and cooking, is so soft as to excite comparatively little mastication. The present may, in fact, be described as the age of pap. Hence the teeth are now called upon to do far less work than in any earlier stage of our evolution, and there has taken place in consequence a great diminution in their size, more especially in the size of the jaws, so that there is now often no room for the teeth to take up their normal positions. And there is generally a complete absence of alveolar ridge behind the last molars. The latter, moreover, are apt to be very small or even absent, while dental caries is alarmingly frequent.

The Instinct to Masticate.—Seeing that the maxillary apparatus of man has for long ages past been put to vigorous use, it is not surprising that the need to exercise it should express itself as a powerful instinct.

During the early months of life the infant's jaws, tongue and lips find adequate exercise in the natural function of feeding. The bottle-fed babies often seek to satisfy their natural instinct, which is unsatisfied with the feeding bottle, by sucking the thumb or finger. The teeth are a provision for biting hard foods, but even before they appear we find the child seeking to exercise his toothless gums on any hard substance he can lay hold of. When the teeth have erupted the masticatory instinct among primitive people finds abundant satisfaction in the chewing of the coarse, hard foods which constitute their dietary, but among us moderns, subsisting, as we do, mainly on soft foods, affording but little exercise for the masticatory apparatus, it does not find its proper expression and thus tends to die out.

What tends to check this, a natural physiological function?

Softness of Food.—The infant finds adequate exercise, as we have pointed out, at the mother's breast. He has to work for his nutriment as the bottle-fed baby does not (excepting where the rubber nipple is carefully formed). Under the modern system children are kept on liquid or semi-liquid diet not merely during the first months, but during the first

years of life, and at the seventh or eighth month all kinds of saccharine foods in liquid and semi-liquid form are poured into the child's stomach; thereafter he is fed on such viands as mashed potatoes and gravy, crusts soaked in milk, milk puddings, bread dipped in bacon fat, pounded mutton, thin bread and butter and the like, and we are told that this is the kind of diet best suited to the young human from the time of weaning to the end of the second year. The same pernicious methods are adopted subsequently. "Perhaps the great majority of children after they have got their complete set of temporary teeth have," writes Dr. Sim Wallace, "a dietary such as the following: Breakfast—bread and milk or porridge, milk, tea, coffee or cocoa, bread and butter, perhaps an egg. Dinner—potatoes and gravy or meat, milk pudding, tea, milk or tea with bread and butter, jam, cakes. Supper—bread or biscuit and milk." Now, food of this kind does not invite mastication and finds its way all too readily into the stomach. No wonder that the child fed on such pappy food acquires the habit of bolting it and learns to reject the hard, coarse foods for the softer kinds; everything nowadays must be tender, pulaceous or "short"—witness the habit of eating bread and butter with the minimum of crust. Order bread and butter at any place of refreshment and the last thing you will be served with is a plateful of crusts of bread. Many establishments make a practice of giving away their crusts as unsaleable.

When we trace the diet of the modern from childhood up we find the same story—it tends to remain soft and pappy to the end. Animal food, as it comes to the tables of the well-to-do, necessitates very little mastication. It is the coarser varieties of vegetables that call out the full functional activity of the masticatory apparatus, but the vegetable food of to-day is rarely of a kind to do this; cooked vegetables, such as potatoes, green peas and beans, can be and generally are swallowed after little or no preliminary mastication, and our flour is so carefully deprived of its fibrous portion and so cunningly dealt with in the bake house and kitchen in the making of bread, cakes and pastry which shall eat light and short, that these articles get very little chewing. While such vegetable products as rice, vermicelli, tapioca and macaroni are, as served at table, so soft that they slip down into the stomach almost as readily as simple milk.

Let anyone run through his dietary of any one day and he will realize how very little work his masticatory appa-

ratus is called upon to perform. It will read something like the following: Breakfast—porridge and milk, eggs, bacon, bread and marmalade. Lunch—fish, tender meat, boiled vegetables, bread, some “sweet,” and cheese, tea, bread, butter and cake. Dinner—much the same as lunch. What opportunity, I ask, does such a bill of fare afford for the development of teeth and jaws and for the proper functional activity of the salivary glands?

Defective Masticatory Apparatus.—Mastication cannot be thorough where the bite is defective, and as a consequence the glands cannot be adequately stimulated and the food, no matter how good, be properly prepared to enter the stomach.

Idiosyncrasy.—Some are temperamentally more disposed to hurry over their meals than others. The katabolic, restless, nervous person is more apt to swallow his food hastily than is the more deliberate and phlegmatic. Thus one of a pair of horses of about the same age and build is nervous and excitable and inclined to bolt its food, while its companion, of more stolid temperament, is a thorough and efficient masticator. The former shows comparatively little wearing down of the teeth and often suffers from indigestion, a large portion of corn grain passing through the digestive tract intact; in the latter the teeth are well worn, indigestion never occurs, and but very few grains pass through the digestive canal unchanged.

It may be objected here that we cannot help temperamental, and to a large extent that is true, but much can be done towards modifying it, and it is something to know where dangers, temperamental dangers, among others, lie.

Circumstances of Life.—Again, in this hurrying, strenuous age people are much less deliberate than in the easy, slow-going days of long ago. A meal is too often regarded as something to be gotten through quickly, as taking up time which might be devoted to something more profitable. Especially is this true of breakfast and lunch; it is no uncommon thing for a business man to hurry through his breakfast in a few minutes, preparatory to rushing off to his train, and his lunch, as likely as not, is as hastily swallowed in his office or at a lunch counter. Tradesmen are apt to take their meals in mere snatches; apprentices, shop girls and other “hands” are not allowed sufficient time for their meals; while, to come to the professions, we all know that the busy medical man and dentist, for instance, are often obliged to take a hurried snack in the short interval between seeing

patients. No wonder that thus circumstanced people acquire the habit of bolting their food. A meal should be regarded as an end and an important end in itself. It should be taken at leisure, body and mind for the time being give up to it, and to agreeable social intercourse. If this rule were always observed a most important source of inefficient mastication would be removed. *Too much food is eaten as a result of insufficient mastication.* Soft foods, which constitute the bulk of our dietary, pass much more readily into the stomach than hard foods, which compel a certain amount of mastication, and for this reason the former predispose to excessive eating, hence a danger at all periods of life, not only in grown-ups but in children, even infants, brought up as the latter are mainly on liquids and pappy foods; many of these consume not only far more than is needful, but far more than is healthful, their stomachs being literally deluged with nutriment.

When the food is of a kind necessitating abundant mastication it is much less likely to be taken in excess, for the longer time taken in masticating the less will the individual be tempted to consume. Even with the soft foods, less will probably be taken if they be thoroughly masticated and insalivated than if bolted.

Thorough mastication, however, not only tends to diminish the amount of food consumed on account of the time and labor which it entails, but it actually reduces the amount needful to constitute a sufficiency, for the more perfectly the food is chewed, the more economically is it disposed of in the system by being more perfectly digested. There will be less tendency to that morbid craving for food which is so frequently an accompaniment of defective digestion. It is certain that appetite and the need of the system are sooner satisfied when food is well masticated and digested than when it is swallowed whole.

The presence of masses of imperfectly masticated food in the stomach may cause disturbance mechanically or by reason of their imperviousness to the gastric juices. We have seen that the digestibility of a food is largely determined by its consistence and that many articles of diet, such as cheese, hard-boiled egg, cocoanut, lobster, and new bread, which have the reputation of being very indigestible, can, if freely comminuted by chewing or otherwise, be rendered quite digestible. Such articles are indigestible—essentially by reason of their compactness; the compact lumps, but little pervious to the gastric juice, tend to undergo abnormal

chemical change in the stomach, and may in this way cause violent local irritation, even to the extent of setting up acute gastritis; or they may paralyze the nerves of the stomach and check gastric secretion and movement, and thus remain "in loco" wholly undigested for hours or even days, the person often suffering frontal headache therefrom.

The passage of imperfectly digested food into the bowel may further aggravate matters. It does not seem improbable that the habitual bolting of food, by the prolonged irritation to which it gives rise, may predispose to cancer of the stomach. Napoleon was a notoriously fast eater, and it is well known that he died from this disease. Sir Frederick Treves points out that in the present-day rush, or even when there is leisure, food is rarely, nowadays, masticated as in the old times, when it was of a coarser nature; hence solid lumps of such articles as pineapple, preserved ginger, nuts, tough meats and lobster are apt to pass beyond the pylorus and, escaping intestinal digestion, to lodge in the caecum and precipitate an attack of appendicitis, the most common predisposing cause of which is a loaded caecum, often preceded by constipation. Sir Frederick Treves contends that this distended state of the caecum encourages catarrh of the appendix by dragging upon it and blocking its orifice, as well as by twisting it and thus interfering with its blood supply.

Mention has been made of over ingesting food material and starchy foods amongst others. The stomach and intestines are often flooded with this latter in a wholly undigested form. The ancients, as we have seen, especially in the pre-cooking period, had to submit this class of food to laborious mastication, partly because of its coarseness, but chiefly to free it from its undigestible cellulose envelope. In these days of soft, prepared starchy foods, very little mastication is required for this purpose, but it is as needed as ever, indeed more needed, if the increased amounts which are now consumed are to be effectively insalivated.

The prolonged mastication and insalivation of starch goes far to complete its digestion in the mouth, so that very little goes into the stomach in a wholly undigested form, for raw starch is freely digested by the saliva.

Too often the stomach of the child, semi-carnivorous, remember, by its ancestry, is literally deluged with pure starch. Many of the patent child's foods contain it, and the bread and milk, mashed potatoes, puddings, etc., are rich in it. Yet in the majority of cases these foods are sent to

the stomach wholly undigested. No wonder these little ones suffer flatulent dyspepsia besides gastro-intestinal catarrh due to the irritation of the toxines from these decomposing undigested masses. These poisons are absorbed into the blood. The tissues become saturated with them and the nutrition of the entire organism is disturbed. The faulty metabolism manifesting itself by a diminished resistance to pathogenic agencies; by a tendency on the part of the tissues to inflame (as shown by a liability in children thus fed to bronchitis, rhinitis, naso-pharynitis, and tonsillitis); by their proneness to tuberculosis, and, finally, by a disposition to rickets, which, no doubt, is essentially of toxæmic origin. This simple fact of thorough mastication to obtain starch digestion has been strangely overlooked. Thus Van Valzah considers that patients who cannot eat potatoes after ordinary cooking can often digest them very readily if they are doubly cooked. Cereals, he claims, should be allowed to simmer all night and then be thoroughly cooked for half an hour in the morning before being eaten. This is an admirable illustration of how the modern methods of preparing food cheat the mouth of its proper work. A much more rational way would be to have those who experience difficulty in digesting starches practise efficient mastication.

What is the explanation of the awful prevalence of adenoids amongst moderns? A child may, with the one exception that he is fed on a pappy, super-saccharide diet, be brought up under ideal health conditions. He may live in the heart of a dry, open country, free from the darkness, dust and tainted atmosphere of the town; sleep with the windows open all night, live out of doors all day, be fed on the most nourishing (too nourishing, it may be) food, be clothed after the most approved methods, and yet in spite of all this we find his naso-pharynx packed with adenoids. The disease is as prevalent in the country as in the city, amongst the poor as the rich, yet in primitive communities it is practically unknown. What is the difference between the material environment of this modern child and the primitive child? What but the factor of diet?

We have pointed out that the young child is largely carnivorous. The mother's milk is such as to meet this desire and need. The jaws, tongue, masticating muscles and salivary glands all get their normal exercise in breast feeding. Sometimes as early as the fourth or fifth month the child indicates a desire to bite. This can be gratified by giving it a chicken bone or chop with the meat practically all re-

moved. This will overcome, to a large degree, the trouble of the teething period. The child should make his first acquaintance with starch, not in the form of a liquid or pappy patent food or bread and milk, but in a solid and somewhat tough form. Till something better is suggested, would suggest hard, well-baked crust as a convenient form. If the crusts be thin, cut into suitable shape and spread with bacon fat or fresh butter, it constitutes a most agreeable morsel. The same principle should be acted upon during later childhood and youth. We should always give the starch in a form compelling abundant mastication. Loaves shaped to give the maximum of crust and minimum of crumbs should be baked hard. This gives abundance of dextrine and not a little maltose and compels efficient mastication if eaten, as they should be, without any fluid.

We do not say that starch in the liquid or pappy form should find no place whatever in the dietary of the present day, for this would imply the prohibition of porridge, boiled potatoes, milk puddings and the like. We cannot put back the hands of time or return to the food of our primitive ancestors, nor is it desirable that we should, but we can at least arrange matters so that a large portion of the starch we consume shall be in a form inviting mastication, such as crust, stale bread, stale cake, biscuits and so forth. The less children get of pastry, or indeed of any luxurious foods, the better; if brought up on the simple, healthy dietary and under healthy conditions generally, they will relish their simple fare more than the choicest dishes of the epicure. If a child's diet contains food that meets his desire to masticate he will develop a habit of masticating which will be applied to the softer vegetable food, and this will tend to mitigate the evil of bolting. Animal food does not need the same amount of mastication as vegetable food, since it is not digested in the mouth, though some contend that the mixture of proteid with alkaline saliva facilitates its subsequent peptonization. Cooked animal food requires more masticating than raw owing to the coagulation of proteids. Dr. Sim Wallace recommends that, in order to obtain proper mastication, meat, fish and poultry should be cut in large pieces, cut thin. Flat pieces about one inch square generally necessitate a certain amount of mastication. It is difficult to swallow a large piece of meat, but when it is cut small and minced little or no mastication is called forth. The younger the child the more underrdone should the meat be.

How are we to know what kinds of food the body re-

quires? The question is a physiological one which is most interesting. To be brief, the healthy appetite should be the guide. The sense of taste, when not debauched, is the conscience of the appetite. Generally speaking, when the economy requires food there is a craving for a specific kind. When it is placed before us our attention should be fixed on it, and the morsel will then be appreciated. It should be broken up and mixed with the saliva and tasted carefully during the process. None but what has been reduced to a cream and rendered alkaline by the saliva should pass the fauces. This becomes habit in time. When the sense of taste has become satisfied there is a warning, almost uncanny, that enough of that or those elements have been taken and the subject turns to something else indicated, and so on till the appetite is satisfied. In this way there is no glutting or sense of discomfort following a meal, providing the mind is at rest and not irritated. Under certain conditions of convalescence or fatigue the original craving is lacking, but may be aroused by a mouthful of meat broth. This is, no doubt, the place in our menu for the broth or bouillon, viz.: the first. Then comes the more sustaining, the meat (or proteid) and vegetable (proteid and carbo-hydrate). It takes five minutes for the flow of gastric juice to start after being stimulated, so by the time the meat course is served the stomach is thus prepared for its work. Then, with the stilling of hunger, we wish to leave an agreeable sensation with the gustatory nerves and yet not burden the digestive organs, and the "sweets," just to the point of satisfaction, are partaken of.

The golden rule in dietetics is to give no directions with regard to food till one has made enquiries concerning the inclinations and habits of the patient.

The habit of borrowing small sums of money—anticipating pay-day—is a pernicious practice and breaks many a friendship. It is no kindness to loan money to a professional borrower.—*Elbert Hubbard*.

**Dental Sepsis: Its Relationship to the System.*

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CHE cases upon which the following observations are based presented purulent infection in and about the teeth. The terms used in literature to indicate this condition are oral sepsis, Riggs' disease, pyorrhea alveolaris, dental sepsis, dental abscess, necrosis, etc. By the internist these terms are very loosely used, and one must turn to works upon dentistry to get any accurate information of the nature and extent of the *local* process. Even in such works, however, there is no adequate explanation of the relation of these variously situated foci to each other. Works on internal medicine contain as yet no comprehensive discussion of this subject, and its causative relation to some of the most destructive systemic processes (arthritis, endocarditis, etc.), a relationship which we know to be of primary importance in the consideration of the etiology, diagnosis, and therapeutics of these conditions. It is the duty of the internist to familiarize himself with this focus of pyogenic infection *in its early stage* and to co-operate with the dentist as with the surgeon in the eradication of foci of pus in any part of the body. The teeth, especially at the pulp, may, like the tonsillar, peritonsillar, and deep urethral tissues, harbor pyogenic organisms and even small amounts of virulent pus without local manifestations, although systemic manifestations having apparently no relation to this source appear from time to time, and may reach a crippling or fatal degree. It is this latent or subtle quality in the local infection which causes it to be frequently overlooked or discounted by the internist. Such foci can often be detected by radiographic examination only. In one instance (Case I) the only manifestation was a slight crepitus of the left temporo-maxillary joint, which was unaccompanied by pain or tenderness. There was slight ear pain, for which the

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patient consulted an aurist. This, and the unusual sound in opening and closing the jaw, was the only complaint. The radiograph showed a pulp abscess. The tooth was removed and a pure culture of *Streptococcus viridans* was obtained from the pulp, socket, and gum, and the blood gave positive complement fixation for the same organism. There was no fever at any time and no leukocytosis. Vaccines were prepared from this tooth, but were not used at the time, as conditions did not seem to justify doing so. A few months later general arthritis developed and the autogenous vaccine was immediately employed, with marked benefit, but not with entire disappearance of the arthritic manifestations. The blood still showed positive fixation for the same organism. On further search, another tooth was found, with small pus focus, and on removal of this there was rapid improvement, with ultimate disappearance of the arthritis. The manifestations of arthritis were pain on motion, active and passive, and slight tenderness on deep palpation, but no redness or local fever. The knees, ankles, wrists, elbows, and small joints of the hand were involved. The temporomaxillary joint was, however, the only one permanently damaged, and in consequence the crepitation persists (see case reports, Case I). This case well illustrates the slow, steady absorption, with destruction, unless the focus is detected and the process checked. It is always possible in the protracted cases in which no removal of the focus or other checking of the infection is carried out, for new foci to develop in the joints or soft tissues. Under these circumstances the condition may become progressive, consequent to but independent of the original focus and often hopelessly destructive to the joints or visceral tissues. The persistence of the temporomaxillary joint signs in the case just cited makes it possible that here may be a new focus of infection which may appear in other localities later. Several such new foci, even though the original focus has been drastically treated by removal of the tooth and by curettage, make the clinical problem one of difficulty, disheartening the patient and baffling the physician. Vaccines under these circumstances are the only rational therapeutic remedy. This case demonstrates the importance of close co-operation between dentist and internist. This obligation to co-operate rests as much with the dentist, if not more so, as with the internist. The dentist may find a tooth abscess with which, in most instances, he deals mechanically. Later the internist sees the same case, and though he may asso-

ciate the history of the diseased tooth with the systemic disturbance which he now finds, it is often impossible, at that late date, to accurately correlate the two processes. The dentist in most instances does not make cultural studies of the pus, and thus the only opportunity of detecting the invading organism and of preparing vaccines may be lost. If, as seems likely, vaccines prove to be the only certain means of combating these destructive pyogenic infections in their advanced stages, the loss of the opportunity to procure this important therapeutic agent would be a serious and culpable omission.

Setting aside the question as to whether the dental involvement is the cause or effect of a general sepsis, the clinical fact remains that the material procurable from such foci frequently offers the only, and often brief, opportunity to identify the invading organism and of procuring materials from which vaccines may be made. I prefer to emphasize this feature of the subject, which is of so great diagnostic and therapeutic importance, rather than that of cause and effect, which, as a question of etiology, involves problems possibly unsolvable. The cases upon which this report is based have been studied in co-operation with Drs. M. I. Schamberg, Alexander Currie, W. D. Tracy, Harold S. Vaughan, dentists of New York City, three of whom are also graduates in medicine. Among the radiographs accompanying this article I have included those of cases which have come under the personal observation of these dentists through whose courtesy I am enabled to reproduce them here.

In using the term co-operation I do not mean to infer that the patients were told to consult the dentist merely, but I accompanied them to the dentist's office and studied with him the radiographs and local conditions. I believe such consultation to be as necessary as those common between surgeon and internist. When a pyogenic dental infection requiring liberation of the pus existed, arrangements were made for bacteriological specimens to be procured at the dentist's office, and later, if conditions indicated, a specimen of blood for culture and complement fixation tests was taken. A certain number of dentists are in accord with this practice: indeed, a small number have gone beyond the medical practitioner, and without his co-operation are studying cases with just such thoroughness as outlined above. There is, however, among the dentists a large class of den-

tal tinkerers, who practice upon the easy persuasibility of the public. A large mass of mechanical work is thus done upon the teeth with often an entire neglect of the destructive focus of pus. A specific instance of this occurred in Case II. In this case there were (see case reports, Case II) areas of pus from which *Streptococcus viridans* in pure culture were obtained. These areas of pus were detected only by the radiograph, there being but slight local symptoms or signs. Into the roof of the mouth of this patient a dentist had inserted an elliptically curved bar of metal as large as the lead of a pencil, with possibly some idea of correcting a dental displacement, but with no correction of the pus focus. Subsequently this patient developed a cervical spondylitis, which cleared up shortly after draining the abscess cavities. One may even go farther and state that some of this mechanical work entraps pus which before such interference was draining into the mouth cavity, and thus at least lessening systemic absorption. Crown-work and filling are two common pieces of mechanical work which, if improperly done, may be a means of thus entrapping pus. A cavity in which a small quantity of pus is allowed to remain may harbor virulent organisms, which slowly extend the inflammation to the surrounding tissues, setting up large abscesses with active systemic absorption. Case IV illustrates the action of imperfect filling by producing irritation and inflammation (see case reports, Case IV). The radiograph in this case showed a shadow which was thought to be a pus area, but proved to be only thickening of the tissues. Cultures from all the suspected areas and from the root of the imperfectly filled tooth (which was drawn) were negative. There was, however, a positive fixation in the blood for three out of twelve strains of *Streptococcus viridans*. Four months prior there had been an acute abscess of a tooth not connected with this imperfect filling, but severe enough to cause pain and swelling and to require radical treatment. No cultures were taken at the time of the operation, but the positive fixation found later and the inflamed areas about to become purulent were significant. This case seems to fall into a group of cases of latent streptococcic infection in which faulty dental work would be a sufficient exciting cause to establish an active local process, with systemic absorption. The faulty dental technique in crown, filling, and other mechanical work here referred to is well known to dentists, and it is mentioned not as an arraignment of the dental profession, but for the information of the general

practitioner. It may be further stated that so far from being at fault, the dentists must be given the credit of pioneer work in dealing radically with pyogenic infection in and about the teeth and in the use of radiography in detecting such conditions. Evidence of this is found in the writings of such dentists as A. Witzel,² L. C. Ingersoll,³ W. J. Reese,⁴ Louis Jack, C. N. Pierce,⁵ and many others who published their observations between the years 1880 and 1900. While these were general considerations following the initial communication of John W. Riggs, of Hartford, Conn., which was made in October, 1875, they all showed an appreciation between these local dental conditions and systemic disturbances. The later writings of such dentists as M. I. Schamberg,⁶ formerly of Philadelphia; Harold S. Vaughan,⁷ of New York; Thomas L. Gilmer,⁸ of Chicago, to mention a few only, show an even greater appreciation of a probable relation between oral sepsis and many serious systemic diseases, an appreciation not yet shown by the majority of general practitioners. Among medical men, William Hunter,⁹ of London, and the late Dr. Kinnicutt,¹⁰ of New York, have been in recent years the most active in bringing before the medical profession the importance of this subject.

There are two chief factors militating against the thorough investigation and prompt treatment of these cases:

1. The dentist and the internist, through the improved standard of dental work, are coming together more and more in consultation and co-operation. This was, however, not always the case, and recalls the relation which existed between the surgeon and physician in England in the days of coffee-house consultation, in which the druggist was the middleman. The physician in those days merited his lower position in the scientific world, and the surgeon justly felt that these doctor druggists were not men worthy to co-operate with. As the internist built up his diagnosis upon scientific research, it became possible for the surgeon to meet with him and study the case. Such is true also of the dental profession, and in 1904 the science had reached such a degree of accuracy that a section of dental surgery was established in the British Medical Association,¹¹ in which dentist and physician participate. Throughout the country to-day there is developing a class of dentists whose opinions are based upon carefully weighed evidence, and who are devising and carrying out operative measures as delicate in

technique as some of the more important surgical operations. This first factor against the proper care of these cases can be best removed by the direct consultation between dentist and internist and their continued co-operation in the care of the case.

2. The second factor is the tenacity with which men and women alike will insist upon retaining rotten fangs in the mouth. The dentist regards the loss of a tooth as the internist does the death of a patient, and in this opinion the dentist has the insistent support of the patient. It is not an exaggeration to say that in saving certain teeth, the dentist may be condemning the patient to a living death through subsequent crippling arthritic infection or actual death through septic invasion of some vital organ. This factor can best be removed by educating the public, through the medium of the internist and dentist, to the realization of the seriousness of these conditions. When this is correctly understood by the patient, the removal of the offending teeth will be as readily consented to as tonsillotomy or the opening of a mastoid. Dr. Hunter¹² has dealt very thoroughly with the obligation of the dentist in this matter, and his opinions are warmly supported by many of the best dentists. I believe, however, that some of his remarks may be taken with great directness by the internist, who is not infrequently the first under whose observation these cases come.

REPORT OF CASES.

CASE I.—W. W., female, aged thirty-five years. Married April, 1912, complained of pain in the left ear, for which she was referred to a specialist, who reported subacute inflammation of the left Eustachian tube. She was under treatment for this from time to time during the summer, but her condition not improving, she consulted, of her own accord, another specialist and was told by him that he found nothing wrong with the throat, ear, or nose, and by him was referred back to me. October 7, 1912, the patient seen again by me, when the following notes were made:

Complaint.—Pain and tenderness located in the left ear. Distinctly audible crepititation of the left temporomaxillary joint.

Family History.—Negative, except that one brother, aged forty-five years, is a victim of arthritis deformans, which began about nine years ago. He was acutely ill for several months, and while the joint condition was not pro-

gressive, he had occasional attacks of fever. He had been seen by several of the prominent consultants of this country. One sister (also under my care) has had septic infection of an antrum, for which she was treated by a specialist. Another sister had involvement of the small joints of the hands about the same time that the brother became infected.

Past History.—Presented nothing of importance, except that wine was taken freely with meals and at other times also. The patient had one child. There was no history of miscarriages or pelvic infection.

Physical Examination.—Presented nothing of importance that has not already been given. The patient was slender and of nervous temperament.

BLOOD EXAMINATION.

Hemoglobin (Fleischl)	78 per cent.
Red cells	5,200,000
White cells	7,400

DIFFERENTIAL COUNT OF WHITE CELLS.

Polynuclear neutrophiles	78 per cent.
Transitional cells	0 "
Large mononuclear cells	1 "
Large lymphocytes	0 "
Small lymphocytes	19 "
Eosinophiles	2 "
Mast cells	0 "
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	100 "

Urine examination was negative.

October 12, 1912, the patient was seen in consultation with Dr. Currie (dentist), and radiographs of the temporo-maxillary joint and teeth were studied. Nothing was observed in the joint, but suspicion was directed to a tooth, which it was determined to remove. In the socket and about the pulp of this tooth pus was found, cultures from which were taken by Dr. Hastings at the time of its removal. Bacteriological report was as follows: Cultures from the tooth, the tissue, and from the tooth socket gave pure *Streptococcus viridans*, and cultures from pus about the gum and about the tooth gave *Streptococcus viridans* and *Staphylococcus aureus*. A blood culture taken a few days later showed not bacteremia, but for seven strains of streptococci the fixation was negative for four strains, and positive for three strains of *Streptococcus viridans*. There was no fixa-

tion for the gonococcus, and the blood for lues was negative. We had, therefore, evidences of a local Streptococcus viridans abscess, with systemic absorption. That the temporomaxillary involvement was a manifestation of this sepsis was a reasonable conclusion, borne out by subsequent developments. The cultures were preserved for the purpose of employing vaccines at a later date should the removal of this tooth and a cleansing of the socket not prove curative, or should other joints show evidences of infection. The patient continued under general observation, with marked improvement of the ear condition. The crepitus of the temporomaxillary joint continued, but without pain or tenderness. In November, 1912, the patient went West, where she remained about two weeks. During this time she experienced, for the first time, pain in the ankles, knees, and wrists. There was no swelling, redness, or other local signs. On her return to New York, in the latter part of November, 1912, the pain continued in the joints noted, and extended to some of the finger-joints and to three toes of the right foot. The pain was worse in damp weather. This condition became sufficiently severe to alarm her, and on December 27 she reported to me. There was no fever and no local signs, except slight tenderness on moving the larger joints and on pressing some of the smaller joints. There was pain for the first time in the left temporomaxillary joint. There has been no chills or sweating. The knee-jerks were present. The pupils reacted normally, and there was no Romberg. It was decided to begin vaccine, and she received her first inoculation January 9, 1913. Up to April 21 she received twenty inoculations. By March 31, except for slight pain in a toe-joint of the right foot, the joints were free of all symptoms, a condition which up to that date had existed for about three weeks. She felt better than she had at any time for several years. The details of the vaccine therapy are omitted. By April 14, 1913, the patient complained of considerable tingling in the legs and swelling and puffing of the feet. There was no fever, and though she had maintained her weight, and her appetite was good, she looked badly. April 21 she complained of feeling wretchedly; joints were more sensitive, and she noticed puffiness of the feet, especially at night. The diet and hygienic surroundings were carefully regulated and a tonic was prescribed and the vaccines were increased. She however continued to do badly. Blood examination showed the following:

BLOOD EXAMINATION.

Hemoglobin	100% (Sahli corrected)
Red-blood cells	4,720,000
White-blood cells	9,000

COLOR INDEX 1. DIFFERENTIAL COUNT.

Polynuclears	71 % (300 counted)
Lymphocytes	19.6%
Large mononuclears	5
Transitions	3.6%
Eosinophiles	0.6
Red-blood cells normal	

Blood negative for organisms, but the complement fixation was positive for the same strains of *Streptococcus viridans* as in the test made October, 1912.

On May 7 the teeth were again thoroughly radiographed, and though a careful study of these by two dentists and myself failed to detect pus shadows, Dr. Currie discovered a small area of pus near a devitalized tooth adjoining the seat of original infection. There was also impingement of a neighboring tooth, which accounted possibly for the pain. This tooth was removed and the area thoroughly curetted, when rapid improvement followed. The local pain entirely disappeared, and in two or three weeks the joints gradually ceased to cause trouble. The general health improved, and except for occasional observations by the dentist the case passed from medical attention. The crepitation in the left temporomaxillary joint persisted, and had been sufficiently marked to be audible to those sitting nearby. This joint, therefore, was probably permanently damaged.

CASE II.—W. R., male, aged forty-four years, married; seen May 27, 1913; complained of pain and tenderness in the vertebral column about opposite the seventh cervical.

Past History.—Presented nothing of importance. Had no children, and wife had had no miscarriages. Used alcohol and tobacco in moderation. Gave an indefinite history of some trouble with the knee-joint, which he attributed to trauma two years before; occasionally felt slight twinges of pain in this knee on motion. Had had slight pain at times in some of the toe-joints. Was an active business man.

Present History.—Vertebral trouble began about January, 1913; not progressive and not noticeable when sitting

or lying still. Up to June, 1912, took recreation in boxing, but since then, on account of the neck condition, had not been able to do so. At times he feared to move because of the pain. In every other particular his general health was good.

Examination.—A large, well-built, healthy looking man; dark complexioned, of American-German parentage. There was no pigmentation of the mucous membrane, and the skin pigmentation was uniformly distributed. Carried his head in a fixed position, suggesting "stiff neck." On lightly tapping the top of the head, tenderness was localized to about the sixth cervical vertebra, at which point the pain was localized; there was also here well-marked tenderness on pressure. A radiograph disclosed no definite change at this articulation.

BLOOD EXAMINATION.

Hemoglobin (Fleischl)	85 per cent.
Red cells	6,016,000
White cells	6,000

DIFFERENTIAL COUNT.

Polynuclear	62 per cent.
Large lymphocytes	4 "
Small lymphocytes	26 "
Eosinophiles	3 "
Transitional cells	5 "
	—
	100 "

Radiographs of the teeth were studied with the dentist, Dr. Currie, and suspicion was directed to the upper right canine and the upper incisor (see Figs. 2 and 6); in addition the dentist detected discharging pus from the upper right canine. On dealing with these teeth radically, pyorrhea, with marked destruction of the alveolus of the upper right canine, which was discharging, was found; also central necrosis of the right upper incisor, which, in Dr. Currie's opinion, was of some duration, together with a pus pocket in the lower left molar under an imperfectly fitting crown. Cultures by Dr. Mann gave *Streptococcus viridans*. The offending teeth were removed and all the infected areas thoroughly cleaned out. Tonic treatment was at the same time instituted. One week after this radical treatment the condition of the neck, which had existed for five months, markedly improved, and by the end of June entirely disappeared. This case had been under the observation of a

dentist, who was consulted for the routine care of the teeth, and who entirely overlooked the purulent condition, inserting in the mouth the badly fitting crown and a bar for the correction of a suspected displacement.

CASE III.—J. J., female, aged forty years; married. Seen September, 1911. Pain and tenderness in left knee-joint.

Past History.—Nothing of importance. Borne two healthy children; no miscarriages. Had been in uncertain health for some years, but condition was attributed to nervousness, nothing definite manifesting itself.

Present History.—The present trouble began with pain and tenderness on the outer aspect of the left knee-joint, aggravated by walking. This joint was treated locally by an orthopedist, and after eight months of wearing a brace and being under general tonic treatment, baths, etc., other joints became painful, including the temporomaxillary joints, making the chewing of food and articulation difficult. One year after the initial knee condition, fever of an irregular type appeared. Eighteen months from the onset an intermittent odor of the breath was noticed, and this first attracted attention to the teeth, which had given only such signs as were considered common and unimportant. On thorough examination of the mouth, pus was found to exude from the gum about a molar tooth, which, being removed, disclosed a pus cavity in the gum, from which was obtained a dram of pus. From this pure culture of *Streptococcus viridans* was obtained. The jawbone was found to be partly involved in the purulent process. The patient sustained a typhoid temperature for four months, with the involvement of many of the large and small joints. Autogenous vaccine was used continuously over a period of three years. During this time phlebitis in one leg developed. For ten months there has been steady improvement in the general condition, but several of the joints seem permanently damaged, and the knee-joints are fixed (by a possible tendon or muscle shortening) at an angle of 45 degrees. This case will be published elsewhere in detail from the bacteriological, vaccine, and arthritis viewpoints. For this reason the above brief outline only is given.

CASE IV.—C. S., widow, aged forty-two years; complained of malaise, indigestion, and broken sleep.

Family History.—Unimportant.

Past History.—Showed repeated attacks of pharyngitis,

and an acute attack of nephritis, without known cause, four years ago. Had not been robust for eight or ten years, but never confined to bed. Twenty-five years before a prominent specialist diagnosed a tuberculous apex in the right lung. From this she seemed to have entirely recovered. Appendicitis, with operation, six years before. Two years before had amenorrhea for several months. Menses had been normal for over a year. Four months before, while travelling, developed a painful swelling over an upper left molar. This was treated by a dentist seen in the emergency, and he drained away a considerable amount of pus and directed her to see her dentist as soon as possible.

Present history dates from November 27, 1912, with complaint of pus about a molar four months before, as given above, but there is no trouble with the teeth at present. Patient was always an active woman, attending to her own affairs, but is now unable to go about without prostrating fatigue. Appetite is poor, and she sleeps but a few hours at night. For the first time in her life she finds relief in remaining in bed.

Examination.—Skin pale, but mucous membrane of fairly good color. Chest negative except for soft systolic blow over the heart. Abdomen negative. Over both lower extremities were pinhead, purpuric spots. There had at no time been any joint pain or tenderness.

BLOOD EXAMINATION—DECEMBER 2, 1912.

Hemoglobin	90 per cent.
Red-blood corpuscles	5,600,000

DIFFERENTIAL COUNT.

Polymorphonuclears	61 per cent.
Transitions	5 "
Lymphocytes	24 "
Large mononuclears	7 "
Eosinophiles	3 "

Urine Examination—Reaction, acid; sugar, none; pus, none; albumin, faintest possible trace; urea, 1 per cent.; casts, none; specific gravity, 1.018.

Blood Culture.—Negative for organisms (agar and broth) for twelve strains of streptococci; the fixation was positive for three.

Examination of the Teeth.—Pyorrhea pocket (See Figs. 2, 3 and 4) about a twelve-year molar. At the root of a filled tooth the radiograph showed a shadow, thought to be due to pus. Tooth was removed and filling was found to be incom-

plete, and from this inflammation extended into the surrounding tissues. Cultures from this area were negative. The shadow in the radiograph was due to thickening of the bone and peridental membrane, secondary to the inflammation. Though the cultures from the tooth were negative, the blood showed positive fixation for three out of twelve strains of *Streptococcus viridans*, and had this local condition remained untreated, an abscess would undoubtedly have developed, as was the case with the other side of the mouth four months previous.

This and Case II. perhaps represent an early stage of a local streptococcic infection with systemic manifestations. In both cases the systemic manifestations rapidly disappeared after thorough local treatment. Such cases require careful watching for the possible development of new areas of infection.

CASE V.¹³—R. S., female, aged thirty years, unmarried; seen February, 1913, complaining of severe pain localized to the left tonsillar region and left ear. The pain radiates toward the mastoid and the neck posterior to the sternocleido muscle, with a centre apparently in the external auditory canal. A thorough examination of the throat and ear by a specialist revealed nothing. There was no fever. The teeth were found to be exceptionally good. There was, however, tenderness on slight pressure on the gum below and posterior to the lower left third molar; the gum was slightly red and puffy. Conditions suggested an abscess, but the radiograph revealed a wisdom tooth impinging directly upon the molar and crowding that tooth (see Fig. 1). This condition, known in dentistry as "impaction," is a frequent cause of reflex pain, and without the use of the radiograph leads to much surmise with regard to possible mastoid and middle-ear disease, retrotonsillar, deep gum, and dental abscesses. These cases are frequently treated by lancing the gum in the hope of liberating supposedly entrapped pus. The loss of sleep on account of the pain and disturbed digestion not infrequently lead to the impression of a systemic condition secondary to the supposed abscess. This case was surgically treated by Dr. Schamberg, who removed the offending tooth, after which the patient was entirely relieved.

SUMMARY.—These cases are selected as representing five important features of general disturbance of the system, secondary to dental disease. In the first case, the dental

disease was detected in part and the organism determined before the joint complications developed. The use of auto-gogenous vaccine in this case would seem to have held the progress of the disease in check, but not until all of the pus areas in the teeth had been cleaned out did the systemic condition show a permanent improvement. The system, however, was probably under the influence of toxic absorption for some months before radical measures were instituted. In such cases there is always a possibility of new and independent foci of infection having been set up. Such a stage in the development of the disease precludes the possibility of checking it by dealing with the original focus merely, and it would seem here that vaccines are our only means of combating the infection. This is true of Case III., in which neither the organism was detected nor the auto-gogenous vaccine employed until many months after the system had been under the influence of the infection, and many joints involved, but this case also represents the ravages of septic infection of dental origin unchecked, as was common with all cases before the teeth were suspected as the original focus. Cases II. and III. represent possibly the earliest stage in the systemic manifestation of absorption of toxins from a dental source. Case V. represents a class in which mechanical disturbance may be mistaken for an inflammatory process. From these cases and others the following symptoms and signs may be classified. In attempting a classification, it should be stated that cases of this type have not, as yet, been studied by internists and dentists together sufficiently to make such a classification complete. It should also be stated that there are a number of characteristics which may prove of great clinical value when corroborated by thorough observation, but which, for lack of such corroboration, are omitted here. Such, for example, are the association of joint involvements in which the upper jaw is the seat of pyogenic infection in contradistinction to an adenitis and burrowing pus when the lower jaw is involved. Again, what degree of alveolar destruction is necessary before systemic absorption takes place? Also, is there any relation between tonsillar and peritonsillar and faucial infections and dental disease? In this connection, Dr. Vaughan's¹⁴ observations with regard to Vincent's bacteria and dental disease are pertinent. We are as yet without any conclusive studies on the lymphatic system draining such areas.

SYMPTOMS.—Malaise, indigestion, fetor of the breath, often intermittent; there may be periods in which the breath is so offensive as to be noticeable some little distance from the patient, while at other times such fetor cannot be detected by careful search. This is frequently called attention to by others, and is rarely noticed by the patient. Loosening of the teeth, which may also be intermittent. Tenderness of the teeth on chewing; an indefinable aching of the gums; pain referred to the ear (internal and external), the mastoid, the cheek bone, the eyes, and fauces. Rapid and sometimes copious loss of hair, which may occur intermittently. All the frank manifestations, such as acute pain and swelling, which immediately attract attention to the teeth, are omitted here, though of course they come into this classification.

SIGNS.—A brick-red tinge about a sixteenth of an inch in width at the dentogingival margin, marks areas of infection. These areas bleed readily on slight pressure. If a wooden spatula is run along the gum margin the diseased portions can frequently be detected by the bleeding-points left in the wake of such pressure. In more advanced cases a diseased tooth, from loosening, can be moved in its socket; a healthy tooth is absolutely immobile. Again, the gross signs, such as destruction of the cemental portions, surface necroses, and visible discharge of pus, together with more obscure signs requiring instrumental examination by a dentist, are not mentioned here in detail, though of course they belong under this head. The most important point in connection with both symptoms and signs is that manifestations of systemic involvement may appear without there being any symptom referable to the teeth in which actively absorbing pus areas may be present. Such systemic manifestations, however, show marked improvement, and sometimes completely disappear with the radical removal of the septic focus. Paramount among these systemic manifestations are arthritis and phlebitis. It is a noteworthy fact, however, that not until an overwhelming sepsis has developed does one procure cultures of any organism from the blood or the joint fluid. A positive complement deviation, on the other hand, from the blood is a fairly uniform finding. Fever, except in advanced cases of systemic involvement, is not common. Grave anemia of oligochromemic type may be present in the early stage of dental sepsis. Oligocytopenia occurs in cases in which the system has been involved for some time. Grave secondary anemia may develop in such

cases. Polynuclear leukocytosis or increase in the number of the white cells is rarely found, even when large pus areas exist in and about the teeth. Glandular enlargement seems to occur more commonly with lower than with upper-jaw involvement. The submental and cervical glands are those usually affected.

DIFFERENTIAL DIAGNOSIS.—While the occurrence of pus in and about the teeth has been found to be the cause of serious sepsis in various parts of the system in a large number of cases, the search for primary foci of pus other than the teeth must be thorough. The deep urethra, the tonsils, the peritonsillar tissues, the antrum, the posterior nares, must all be excluded. The testing out of the blood for complement deviation for various organisms may prove the most direct evidence in the absence of local manifestation. It may be well to repeat that the blood gives negative cultures unless an advanced degree of sepsis has developed, and in such cases the condition has usually gone beyond the stage in which it can be influenced either by local, general, or vaccine treatment. Case III., while the condition remained localized to one knee, was suspected of being tuberculous. Its real character was detected only when pure cultures of streptococcus viridans from the tooth abscess and a positive complement fixation of the blood for the same organism were obtained, the blood otherwise being negative. Fluid from the knee-joint was also negative.

Radiographs of the teeth should be placed first among the means of detecting pathological conditions in the jaw. In some instances, for example where the pus lies in a thin layer over the tooth and not in sufficient quantity to produce a pocket, nothing may appear on the plate. This occurred in Case I., when, by a second examination, the pus was reached by probing only.

Reference has already been made to impaction and misplacement, with the consequent swelling and reflex pain which may simulate these septic conditions.

TREATMENT.—A realization that one is dealing with abscess cavities, due possibly to the most virulent organisms, with the inevitable absorption of destructive toxins, is essential to the prompt and radical care of these cases. While it is true that the teeth (and possibly the tissues about them) resist the entry of organisms themselves into the system, the possibility of a bacteriemia always threatens such cases, with probably the development of new foci of pus in

the endocardium and other like vital organs. Abscesses in and about the teeth should be attacked with the same energy as pus foci in any other part of the body. Infected teeth should either be removed entire or in part by operating above the tooth through the gum, an operation now done with great skill by many dental surgeons. Cultures should always be taken at *the time of the removal of the tooth or the operation*, and in the event of a positive culture, vaccines should be prepared and stocked in case they may be needed at some later date. Filling of the teeth and temporizing with a hope of saving a tooth which has been attacked by pus should only be permitted after careful consultation with a competent dentist. The physician is under obligation to the patient to make him realize the seriousness of the possible consequences of the seemingly unimportant condition of the teeth. This part of the treatment cannot be too strongly emphasized, and the responsibility of temporizing with or retaining septic teeth should be placed by the physician and dentist upon the patient.

Reunion of R.C.D.S. Freshman Class of 1902.

CHERE was recently held in Toronto a meeting of the Toronto members of the freshman class of the Royal College of Dental Surgeons of 1902, at which it was decided to hold a reunion of this class during the next meeting of the Ontario Dental Society.

The following officers and committees were elected:

President—Dr. H. A. McKim, 68 Howard Park Avenue.

Secretary—Dr. N. S. Coyne, 533 St. Clair Ave. W.

Treasurer—Dr. Gerrold L. Smith, 137 Annette St.

Clinic Committee.—Dr. W. H. Doherty, 229 College St., Chairman; Dr. J. A. Bothwell, Dr. E. E. Bruce.

Banquet Committee.—Dr. E. A. Dolson, 240 Broadview Ave., Chairman; Dr. A. R. Jordan, Dr. Alex. Elliott.

Programme Committee.—Dr. Staples, 267 Yonge St., Chairman; Dr. R. W. Hull, Dr. G. C. Phillips.

Entertainment Committee.—Dr. Margaret Gordon, Chairman; Mrs. Kirk (Dr. Mildred Hanna), Dr. E. A. Grant.

Attendance Committee.—Dr. N. S. Coyne, 533 St. Clair Ave. W., Chairman; Dr. Wessels, Dr. A. M. Weldon.

**Safeguarding Rural Children.*

BY GEORGE STARR LASHER,
Department of Public Instruction, Lansing, Michigan.

CHE rural one-room school is here; it has persisted despite all its limitations for years; it will remain for many years to come. It is well enough to hold the ideal of the consolidated school with its splendid possibilities, but why not face the issue squarely, recognize that the ideal belongs to the future as far as the majority of rural districts are concerned and bend our energies toward making the present country school as healthful, as attractive, as efficient as possible?

Michigan is one of the richest states in the nation, its natural resources are superb, its population ranks high in intelligence and culture. There is no reason why its schools should not be among the very best, yet the Russell Sage foundation investigation resulted in a ranking of fourteenth. Even this indicates that the state is considerably above the average, so there is a basis for the belief that the conditions to be found in Michigan among the rural schools are better than in many states that have equal advantages, yet a survey of the situation reveals the appalling fact that the vast majority of boys and girls in rural districts are spending from four to six hours every school day in buildings which are a menace to their health.

In 82 of the 83 counties in Michigan, there are 7,234 rural one and two-room schools. Of this number, 2,075 possess heating and ventilating systems, 499 basement furnaces and 888 jacketed stoves. The children in 3,772 schools or more than fifty per cent. suffer from stove-heated rooms which are inadequately ventilated. Only 1,260 or approximately eighteen per cent. have drinking fountains, while but 3,606 or less than one-half even boast individual cups. But 151 safeguard the children from the dangers of the common roller towel by the use of paper towels and 140 by the use of individual towels.

Comparatively little attention is paid to correct seating of children. In only 435 schools or less than six per cent.

*Read before the Fourth International Congress on School Hygiene, Buffalo, August, 1913.

are found adjustable seats and desks. But 1,709 schools, or about twenty-three per cent., have the seats and desks properly arranged, the same-sized seats and desks in the same rows from front to back. In 3,959 schools there are not a sufficient number of small-sized seats and desks, so that thousands of youngsters have to sit all day with their feet swinging in the air and must distort their backs in order to write or figure because the desks are too high. Small chairs and tables are provided for the little ones in only 782 schools.

The lighting of the schoolrooms is causing children and teachers to become spectacle wearers by the hundred. In 887 rooms children are forced to face open windows, while a similar fate falls to the teachers in 2,575 schools. The eyesight of the vast majority of children and teachers is impaired by cross lights, because in 6,457 schools, or eighty-nine per cent., there are windows on both sides of the room. Schools which have the lighting entirely from the left side are limited to 242, while 360 light from the left and rear. These injurious lighting conditions are modified in only 993 schools by the hanging of window shades at the bottom, so that they can be pulled up rather than down. Correct decoration of the walls is found in 2,072 schools.

That the outhouse problem is serious is shown by the fact that but 4,052 schools have well built, widely separated outhouses, while only 123 have inside toilets. Ample playgrounds are scarce. School grounds containing at least two acres are found in only 170 districts, while those possessing at least one acre number 2,526. No fewer than 4,060, or over fifty per cent., have one-half an acre or less. The schools possessing satisfactory water supply total 4,463. The information for this survey was furnished by the county commissioners and while not minutely accurate, is conservatively true. At least, the conditions are not exaggerated. Despite this rather gloomy report, I am not pessimistic in regard to the situation. Practically all of the improvements noted have come within the past few years and I believe they will continue to increase not only steadily but rapidly.

So much for the actual situation, now what is to be done about it? Fortunately, manufacturers with foresight have been studying the problems, so that it is to-day possible to make the country schoolhouse as healthful, sanitary and comfortable as the city school room at a decidedly moderate cost. There is not a one-room building in the state but that can be remodeled and improved to meet the demands for

health and comfort at a cost of less than \$500, while the great majority can be brought up to standard for a much smaller amount. Districts that cannot afford to give their children decent and healthful conditions are so few that consideration is not necessary.

Systems which thoroughly ventilate the schoolroom and warm it evenly without the direct rays striking any child, can be purchased for from \$95 to \$125 or be made for less. Sanitary bubbling drinking fountains for districts where there is no water system do away entirely with the use of cups and cost from \$13.25 to \$20. Indoor chemical closets, which are sanitary and odorless and require neither sewerage nor water under pressure, solve the outdoor outhouse problem at a cost of from \$20 to \$40 each. Adjustable seats and desks that can be made to fit the individual boy or girl vary from \$2.10 to \$3.50. Paper towels, costing about 10 cents a hundred, eliminate the source of nearly every skin disease epidemic, the common roller towel. Proper window shades correctly installed so that they may be pulled up rather than down, are not expensive, neither are floor brushes and dustless cloths to replace brooms and feather dusters. The cost of remodeling the building to permit adequate and correct lighting would probably vary from \$25 to \$75, while the expense of decorating the interior to aid in the lighting is trivial. It is not necessary to argue that such an expenditure by a school district would be the best possible investment, as it would be insurance against doctors' bills and epidemics; would permit the teacher and the children to do efficient work every hour of the school day; would be the most effective advertising a community could present to farm purchasers.

No one can question that rural districts need improved conditions while the cost is not so excessive as to be prohibitive for any district or a heavy burden for the majority. The situation now resolves itself into the question, what can be done to bring about the desired changes? The answer, in my judgment, lies in the general education of the people as to existing conditions and needs; in the intensive education of teachers and county superintendents; in legislation regulating the construction of new buildings and the remodeling and equipping of old structures.

In Michigan, we have begun the work of general education through the department of public instruction. Press sheets are sent out every few weeks to each newspaper in

the state. They are prepared by an experienced newspaper man, so editors use the articles freely as they are written in a concise, direct style and, varying from the short paragraph to a half column, make most desirable "time copy." No more effective way has been used to bring about a general understanding of school laws, conditions and needs throughout the state.

Michigan has adopted a system of standardization which is arousing wide interest in the state. A certain minimum standard is fixed and any school reaching that requirement will be given a framed diploma designating it as a "Standard School," while a metal plate, bearing the same inscription, will be placed on the school building. When District No. 4 is so honored, it can well be anticipated that the residents of District No. 5 will wonder why their school is not also recognized.

The qualifications which concern the health of the children are: Ample school grounds of at least one acre; two well kept, widely separated outhouses or inside toilets; school house well built and in good repair, lighted with some attention to correct lighting; good blackboards, some suitable for small children; heating and ventilating system; sanitary bubbling drinking fountain; hardwood floor; seats and desks properly placed so that the same sized are in the same rows from front to back and a sufficient number of small sized seats provided.

The department of public instruction has in preparation a manual of school house construction and improvement which will give a number of detailed plans for the erection and improvement of one and two-room buildings. The plans will be accompanied by complete specifications and estimates and adapted to varying needs. Illustrations of proper equipment with prices charged will be given, together with many helpful suggestions. In addition, the department is requesting all districts that are planning to build to submit their plans for expert criticism as to heating, ventilating, lighting, arrangement, toilet accommodations, etc. In this way, it is expected many mistakes due to unwise architects will be avoided.

That visual impression is most effective was strongly emphasized upon my mind during the past few weeks while making a tour of Michigan with the state health train. I had charge of an exhibit of sanitary school equipment which was a feature of the train, arousing great interest among general visitors as well as school officers and teachers. Com-

paratively few had ever seen an adjustable seat and desk, an indoor chemical closet, window shades hung at the bottom of the window instead of at the top or a sanitary drinking fountain for rural schools. Many had never seen paper towels or heard that a school room could be properly heated and ventilated by a room furnace, while to still more, lighting entirely from the left side of the pupil was a new idea.

Included in the exhibit was a display of jaw casts showing the results of lack of attention to children's teeth and the effect of adenoids. The interest in this was noteworthy, as it seemed new to the majority of parents, many of whom realized for the first time the cause of their children's mouth-breathing, deafness and associated afflictions. The number of children in the crowds visiting the cars who were obviously affected by the throat growths was surprisingly large and their presence emphasized my statements.

The exhibit train will reach probably fifty thousand people before the tour is completed, and will undoubtedly prove a great missionary agency for better school conditions. The thing that impressed me deeply was the seeming ignorance of the general public in regard to the needs of school children and the possibility of meeting those needs. To most live educators all that is somewhat of an old story, but to the general public it is new gospel and thoroughly appreciated.

Another great agency for this wider enlightenment is the annual school officers' meeting held in every county in Michigan. A representative of each school board is expected to attend, and as he or she is entitled to two dollars a day and traveling expenses for such attendance, most boards are represented. Some member of the department conducts the sessions. These meetings were started six years ago, and at first school law absorbed the interest and the entire time, but more recently, general educational problems have predominated and the questions of school hygiene and sanitation are most strongly emphasized. The Michigan law gives the officers almost complete taxing power, making the board of education the court of last resort in the proper remodeling and furnishing of the school buildings. The result of the agitation in the officers' meetings for better conditions is shown by the decided advancement in the state during the past two years.

No more powerful stimulus toward this same end can be given than by intelligent and efficient teachers and county

superintendents, but both are in need of an intensive education along these lines. In visiting schools, the thing that has impressed me most decidedly is the pathetic ignorance of the great number of teachers in the most common sense principles of hygiene and sanitation, and that statement applies to city and village superintendents and teachers as well as to those in rural districts, to so-called trained teachers as well as untrained.

It is a curious paradox that the university, state, normal schools and colleges require a somewhat extensive course in history of education, yet none of them demand a knowledge of school hygiene and sanitation. There is no question but that an individual can become a splendid teacher without knowing who devised the kindergarten or how the various theories of education originated, but no one can do his duty by the boys and girls under his supervision unless he understands that the children must be seated so that they can rest their feet firmly on the floor and use the desk in front of them without distorting their backs.

Comfort is essential to good work, and the first thing that a really successful teacher must do in order to develop efficiency among his pupils is to see that the school room conditions make for comfort and health. The superintendent who does not thoroughly understand the heating and ventilating system of his school so that he can be sure that the janitor is not saving coal at a sacrifice of children's health, is not fit to be a superintendent. The sooner the dry rot in so many courses in higher institutions of learning is replaced by live subjects that will make it possible for the teachers to teach correctly the fundamentals of right living, the more hope there will be for the coming generation of men and women. The institution which does not train its product in the principles of school hygiene and sanitation and how to apply those principles cannot but fail in its real object, the development of the right kind of teachers.

The most effective way to do away with the dangers of the common drinking cup, the common roller towel and other insanitary articles of use is to teach children the actual dangers of those things. People have at last discovered that it is possible to know how to live correctly without knowing the anatomy of the human body. It is vastly more important that the child shall know how to clean his teeth than to know just how those teeth are constructed. Teachers must be trained in health knowledge and be made to appreciate that the health of the child is of much greater

importance than the elements of arithmetic, geography and all the other academic subjects combined.

The course of study, which under the present law must be followed in all Michigan schools, except city districts, outlines work in everyday hygiene. This is supplemented by helpful bulletins on various health questions issued by the department of public instruction and the state board of health. Last year eye testing charts were sent out for use in every school room, and the number of children found to be suffering from defective eyesight was overwhelmingly large. Teachers were urged to report the condition to the parents and in many cases, dull children were transformed into bright students, because, with the aid of glasses, they could see with some degree of correctness. The devoting of eight out of ten physiology questions to hygiene and sanitation in the state teachers' examinations is also proving effective in training teachers.

Education of the general public and of the teachers is a somewhat slow process, so if any sweeping reform is brought about in school conditions, it must come through mandatory legislation. If the state demands compulsory education, as practically every progressive state does, it most emphatically should demand compulsory health conditions in every school district. It is an absolute injustice to force parents to send children to school during the formative years when the conditions are a menace to the health of the children. Neither is it fair to coop children up for from four to six hours a day in a room that is uncomfortable, unattractive and unhealthful.

In order to prevent districts from reproducing the same mistakes in new buildings that are so glaringly conspicuous in the vast majority of old buildings, laws should be enacted to require boards of education to submit their plans to competent state authorities so that the details of lighting, heating, ventilating, arrangement, toilet accommodations might be corrected. No district should be permitted to expend any money unless the requirements of such board are complied with.

The state officials should also have authority to condemn buildings that are insanitary or unsafe and to require certain improvements and equipment that make for health. Unless the board of education acts under the instructions of the officials, then the latter should have authority to make such changes as are necessary in their judgment and

assess the cost of the same against the district. Michigan has a law that makes it possible for the truant officer, under direction of the county commissioner to require districts to meet any qualifications in regard to outhouses that he demands and, for the first time, many districts are getting outhouses that are decent, healthful and free from moral filth. The law works exceptionally well in this one respect, and would do the same in regard to general conditions of the school.

Too long have lawmakers, educators and people in general entertained the silly fallacy of "reddy cheek and glowing health" of the country lad and lass. As a matter of statistics, the death rate among children of the country is as great as that in congested cities. If many country children are healthy youngsters it is in spite of the conditions under which they live in school and often at home, rather than because of them.

The country school children need proper health conditions as much as their city cousins; it is possible to secure such conditions at moderate expense. The members of the communities and the teachers must be brought to an appreciation of those facts. Even with that, mandatory legislation will be essential to safeguard the rural children in every community. If this country is to possess the quality of citizenship which will guarantee its supremacy intellectually, commercially, artistically, physically and morally, it must require not only compulsory education but compulsory health conditions under which to gain such education.

Medical Inspection in Valparaiso Public Schools.

By OTIS B. NESBIT, M.D.

County Health Commissioner, Porter County, Indiana.

SCHOOL inspection in Valparaiso, Indiana, was established in March, 1910, to assist in controlling an epidemic of scarlet fever which had persisted in the city for two and one-half years. Two physicians, without compensation, carried on the work, with the essayist, the

*Read before the Fourth International Congress on School Hygiene, Buffalo, August, 1913.

balance of the school year, there being three school buildings, known as the Central, the Columbia, and the Gardner schools. The last case of scarlet fever in 1911 occurred in June. The city went until April, 1912, when three cases appeared about the same time, two being school children, telling us some mild case was at large. It was not found in school.

Our schools opened September 33rd, 1912, and the inspection failed to find a case of quarantinable disease. No case of scarlet fever was known to exist in the city. The second week of school passed with no cases. On Sept. 24th a girl in the fourth grade, Central Building, was taken sick with scarlet fever. The case was not diagnosed until Friday. On Friday night another case developed from the same room. Monday all pupils were in attendance except the two who were sick. An inspection failed to reveal any pupil with the disease, but a pupil was found with a mucopurulent discharge from the nose, with enlarged tonsils, several decaying teeth, and adenoids, who was the last known case of scarlet fever in the city, having taken sick June 1, 1912, and released from quarantine July 15th. This pupil was regarded as a probable carrier and was excluded from school until her nose was dry. She was re-admitted. After eight weeks the two cases returned, and no further trouble occurred in that building during that semester. January 20th the new semester opened; the probable carrier was promoted to Room 5. On January 22nd and 23rd she was out of school with a cold, returned the 24th, and on the 27th a pupil in the room was stricken with scarlet fever. On this date the inspection failed to find anyone in the room or school except this probable carrier, whose nose and throat presented about the same appearance as before. She was again excluded, and after re-entering, no further trouble occurred in the room or building until a boy who had been ill was permitted to re-enter the school without seeing the physician. He was in one day and was found the next morning with a profuse skin desquamation and a history of illness that made a diagnosis of scarlet fever easy. His brother had come from an adjoining city sick with quinsy, and his sickness, with a brother's under school age, followed. This pupil was in the sixth grade. When found, the nose and throat were free from abnormal discharges, he being one of the type that do not freely distribute discharges and infections. He was ex-

cluded from school and the home quarantined. An inspection of all pupils found no suspects. The inspector explained the situation to the pupils, and told them how scarlet fever was spread, advised all to return to school at every session unless ill, and to stay from school and see a physician for any mild case of sore throat or ill feeling, and explained its importance. The method of schoolroom cleaning was explained to them. The pupils were excused until the afternoon session. The room was disinfected. The pupils' books were disinfected by the Beebee Method. School resumed at 1 p.m.; all pupils were back except two, both returning the next morning. The pupils were inspected every day for four days, and not a case developed, nor did any other case occur in pupils attending this building during the school year.

In another building we had only two cases of the disease. One source not being determined, except that it certainly did not occur from a school exposure. The other case went to Chicago to spend Christmas with a bachelor lady physician. The physician had a dear friend who had two children. One had scarlet fever. The physician took the other child to her home to keep until after the quarantine was lifted. On Monday following, the Valparaiso girl went to visit the doctor. She played with the doctor's other guest, returned home Friday, developing scarlet fever that night. This occurs so frequently, and so little notice taken of it, is why I recite it. The Chicago doctor was afraid the child she took home with her was coming down with scarlet fever, but decided it was not, being, as she said, a very mild sore throat. Children taken from where scarlet fever is known to exist, with red throats, nasal discharge, and the mildest symptoms, are frequent carriers and distributors.

Scarlet fever did not occur in the Gardner School until in the second semester, when three cases, from three different rooms, developed the same day. Nothing was found in the school, but all gave a history of having been with a girl whose sister had the disease, and this girl had not been quarantined and was living away from home. She gave a history of having had a sore throat, and was probably the source of these cases, as well as three cases outside of school.

A teacher in this building developed the disease on

Thursday, and had been visited by a young man from a near-by city on Sunday. The young man had suffered from a very severe sore throat ten days before. He came from a city which had much scarlet fever. This teacher was released from quarantine on the 42nd day and returned to school on the 43rd day after the beginning of illness without the permission of the school physician, and remained the day. She was excluded the following morning under the rule of two weeks' exclusion from school after release from quarantine. The following Sunday a case developed in one of her pupils.

The week following the release of the three cases occurring the same day, a boy in the neighborhood developed the disease. The children had not returned to school.

In 1910 there were 51 cases of scarlet fever among pupils, who lost 1,526 days in attendance. In 1911 only two cases, losing 80 days. In 1912, ten cases, compelling them to be absent 272 days.

The number of cases attributed to school exposure in 1910 was 31; in 1911, 0; in 1913, 3.

In nearly every case of scarlet fever in this city since September, 1910, we have been able to trace an exposure of the patient within four days. *First*, to some person known to have the disease. *Second*, a person who had previously, even months before, had scarlet fever, and having a diseased condition of the nose, throat or teeth ever since. *Third*, to persons who had recently been with known cases, and gave history or evidence of mild infection.

We have had no cases that pointed to infection from things, such as books, clothing, houses, etc.

DISINFECTION.

For disinfection material a mixture of the Cresols, the Phenol coefficient being known, is used.

The one used last year had a Phenol coefficient of 3.92, and was used 1 part to 80 parts of water.

METHOD.

A 1 to 80 solution was used daily on the banisters or stair hand-railings. When scarlet fever occurred in a pupil while at school the books were removed from the sick pupil's desk and disinfected. The seats, wainscoting, lower window casings, the chalk troughs, door (including knob), and the interior of the clothes closets were washed with

the disinfectant. The floors of the room and cloak room were mopped with the same. As soon as the floors and seats were dry school would resume.

DISINFECTION OF BOOKS.

When books were fumigated the Beebee Method of immersing the books in a solution of 2 per cent. Phenal crystals in gas-machine gasoline for 20 minutes was employed. The books then were allowed to stand on end for several days in the storeroom.

The mortality record during the school year of 1911-1912 was one pupil, age eight, dying of acute dilatation of the heart due to emphysema.

During the school year of 1912-1913 was three, one age 10, tetanus; one, age 11, septicemia due to acute endocarditis, and one, age 16, of pneumonia. No deaths occurring during the vacations directly attributed to acute conditions arising during the school year. The school enumeration in the city in 1912 was 1,735, with two deaths of school age that calender year.

Other activities of the department have been the making of a physical record of the pupil, a limited study of some of the mentally deficient, and the establishing of a manual training class for them.

Free operations, dental and surgical, have been provided for some.

Ventilation and heating have been studied sufficiently to know our plants are inadequate, and the opening of the windows during exercise period is the rule.

The teaching of hygiene and sanitation has been emphasized by a School Health Exhibit. Talks have been carried on before the physiology classes in the grades and high school, with microscopic demonstrations, and the cultivation of bacteria from water, milk, air, and from mouth discharges and fingers, following the outline issued by the Indiana State Board of Health.

Public health lectures under the auspices of the County Medical Society have been well patronized, and it will furnish two lectures a month during the coming winter.

Removable Bridge-Partial Denture Work

Dr. Cummer's Post Graduate Course.

ONE of the most noticeable results of the world-wide educational campaign for a clean mouth is the keen appreciation on the part of the more desirable class of patients of the mechanical and sanitary shortcomings of the ordinary fixed bridge as well as ordinary partial plates type of restoration. Through the work of Hunter and others, the medical profession (whose potent influence in molding public opinion in matters of health, oral and otherwise, must be acknowledged) is as keenly alive to these unhealthy conditions and their tremendous influence on the general health following a large percentage of fixed bridge and other restorations as to the advantage of the removable, sanitary and mechanically efficient restorations of the removable bridge-denture type. The practitioner who has the foresight to acquire the handicraft and knowledge necessary for this type of work ensures himself a leading position in his community and all that means both professionally and financially. With these facts in mind, approximately sixty-five per cent. of the time of the class now more than half formed by Dr. W. E. Cummer for August 31st to September 14th, 1914, in the College building, Toronto, will be devoted to this subject. Every known and proven phase of this subject will be discussed and demonstrated, including the Roach, Gilmore, Stud, Clasp, Bonwill Clasp, extension, rest, bar, interproximal clasp, etc., etc., and every member of the class will leave with such equipment in handicraft and knowledge as will enable him to deal with any case with certainty and success. Members will also be thoroughly grounded in the latest and most successful principles of anatomical articulation, impression taking by Greene method (those who have had difficulty in securing adhesion in full cases will appreciate this), in fact all that is new and proven in prosthetic dentistry. Dr. Geo. H. Wilson, of Cleveland, is preparing lectures and clinics on the subject of plaster and vulcanite, which will embody the last word on the accurate manipulation of these fundamental materials. The date of the course is concurrent with the Canadian National Exhibition, making the reduced railroad rates available as well as the opportunity for members of the class to visit the Exhibition during spare time. A booklet

describing the course is nearly off the press and may be had on application to W. E. Cummer, 2 Bloor St. East, Toronto. From the number and professional standing of those already registered, a most successful and instructive session is assured.

British Columbia News.

REPORTED BY J. E. BLACK, D.D.S., VANCOUVER.

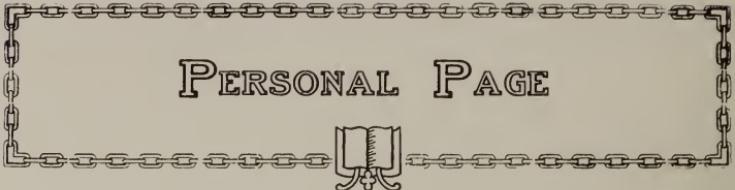
CHE last annual meeting of the British Columbia Dental Society was largely attended and a committee was appointed to report at the next meeting on the relationship of British Columbia to the D. D. C.

Dr. Magee, of St. John, N.B., was recently entertained at luncheon by the Vancouver Dental Society and gave a very interesting explanation of the benefits to be derived by membership in the D. D. C.

The Oral Hygiene campaign inaugurated last fall by the Vancouver Dental Society has had most successful results. Numerous lectures have been given to different organizations, and an invitation has been received from the School Board for lectures to be given the schools. The Society has responded by arranging two, so far. Owing to the difficulty of using the lantern in some schools, it has been advisable to leave the rest of the work until the schools open in the fall.

Dr. Bamford, the school dentist, appointed in December, has more than he can attend to, and at the earliest opportunity it is the intention of the School Board to appoint another dentist to the staff.

Dr. Telford has been elected President of the Vancouver Dental Society for the coming year.



PERSONAL PAGE

Dr. G. H. Campbell, of Orangeville, is contesting the Mayoralty of that town, to fill a vacancy caused by the appointment of the present Mayor to the Crown Attorneyship. Good luck to you, Dr. Campbell.

Dr. John R. McGregor, of Elora, has been confined to his home for the past six weeks with inflammatory rheumatism, but is now progressing favorably.

Dr. Landymore is opening an office in Brantford, having disposed of his Mount Forest office to Dr. Ross.

Dr. Fred Frank, of Shelburne, has returned following a very pleasant three weeks spent in the Cobalt silver district.

We are glad to learn that Dr. W. H. Bowles, of Orangeville, has returned to his office after an illness of about a month.

Dr. W. Marshall, of Owen Sound, has left on a two months' fishing trip to Manitou Island. Here's hoping the fish may bite.

Dr. G. W. Spence, of Wiarton, is moving to Listowel, having purchased Dr. W. T. McGowell's practice.

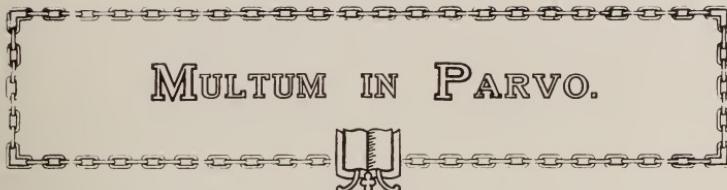
Dr. Ceasar, of Goderich, Ont., is enjoying a few days' trout fishing in his preserve near Markdale.

To further the work of the Rochester Dental Society, which gives free dental clinics for the children of Rochester, the State Board of Health has sent one of its staff, Dr. W. A. White, to Rochester for a series of talks, illustrated by lantern slides, on the subject of mouth hygiene. Dr. White has a very complete set of lantern slides illustrating every phase of mouth hygiene and has the happy faculty of not only interesting boys and girls but also of impressing on their minds the great necessity of caring for their teeth early in life.

Dr. White began his work Monday at No. 26 School, speaking at one school in the morning and another school in the afternoon.

Obituary.

Dr. Gordon Grant, of Orillia, passed away May 25th, after a very brief illness. The sympathy of the profession is extended to the late Dr. Grant's family.



MULTUM IN PARVO.

This Department is Edited by C. A. KENNEDY, D.D.S., 2 College St., Toronto

Librarian, Royal College of Dental Surgeons of Ontario

*Helpful Practical Suggestions for publication, sent in by members
of the Profession, will be greatly appreciated by this Department.*

AN INEXPENSIVE METHOD OF SEPARATING PLASTER IMPRESSIONS.—Dilute ordinary writing ink half by half water and paint impressions, using small brush and letting ink dry into plaster. Then make soap solution by cutting up a piece of soap and putting the clippings into water and stirring same until lather appears. Then, after the impression is dry from the ink, soap same thoroughly and let dry for a few minutes; then wash surplus soap off and pour impression. When plaster is perfectly dry you will find no difficulty in separation, as the ink gives a clear line of demarcation.—*Edward Graboff, Digest.*

PREVENTING SOLDER FROM FLOWING.—Any portions of a crown or bridge to which it is undesirable that solder should flow are coated with ordinary ink, after heating the piece. The borax is subsequently applied, and the solder will be confined to the desired areas.—*Journal Odontologique, per Sud-Est Dentaire, Cosmos.*

ENGINE MALLET FOR VIBRO-MASSAGE.—The engine mallet will be found useful for vibro-massage by attaching to it either a large foot-plugger covered with rubber dam, or, better, a screw-plugger that will receive a wide-ended rubber button. The strength of the blow should be regulated so as not to be too heavy.—*F. Byrne, British Dental Journal.*

PAPER CUPS AS PLASTER-MIXING BOWLS.—Sanitary paper cups, instead of being thrown away after they have been once used, can be used as plaster bowls for mixing investments for inlays, etc., then thrown away with their burden of unused waste plaster.—*Dental Dispensary Record.*

ORAL HEALTH.

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ASSOCIATE EDITOR — — **W. H. DOHERTY, D.D.S., TORONTO, ONT.**

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Vol. 4

TORONTO, JULY, 1914.

NO. 7

EDITORIAL.

The Problem of Dental Caries.

ONE cannot read the modern authorities on the cause and prevention of dental caries without coming to the conclusion that this whole question is, at present, a maze of irreconcilable theories, out of which the profession will some day emerge into the clear light of a perfect understanding of the question or drift back again to the hazy conception of the subject that has existed since Rome flourished.

It requires little power of reasoning to conclude that it is the contact of *something* with the tooth that is the prime cause of dental caries. Even the ancients arrived thus far in solving the problem, and general recognition of this fact is responsible for the various waves of enthusiasm for some system of polishing the teeth and for the general use of tooth brushes, dentifrices and mouth washes.

It seems clear, on the other hand, that it was never intended that prophylaxis and the use of tooth brushes, dentifrices and mouth washes should be necessary. Entire dependence upon these empirical efforts at prevention is no more to be commended than the indiscriminate use of drugs in allaying symptoms of general disease, when the observ-

ance of natural laws would establish a cure.

That it is an acid that is responsible for the destruction of enamel seems to be established, as is also the fact that the acid is the result of fermentation of some form of carbohydrate material. Here unanimity of opinion ceases. Is it free acid in contact with the teeth that does the damage? Is it nascent acid beneath the bacterial plaque? Is it remains of carbohydrate food lying about the teeth or glycogen in the saliva and blood upon which the bacteria of caries thrive? Has the potassium sulphocyanate content of the saliva any significance? Are dentifrices harmful or beneficial? Are mouth washes of any value? Why are dirty mouths often immune and apparently clean ones ravished by decay? Is caries a dietetic disease? Is it the consistency of constituent of food which plays the greater part?

Read Miller, Pickerill, Black, Williams, Gies, Lowe, Kirk, Wallace, Bunting and many other original investigators, and your brain is in a whirl at the end, in trying to reconcile the findings and theories of these authorities.

The point for the profession to grasp is that a man may be an eminent scientist and yet not always draw correct conclusions from his findings. Even Miller, in his enthusiasm, overlooked one or two obvious deductions. It is no task to read a book like Pickerill's. Every dentist should have it and the others in his library. No scientist will solve this problem alone in his laboratory. The possibility of the prevention of dental caries will be an accepted fact only when the profession, as a body, has accepted the theory as harmonizing with clinical practice. Herein lies the opportunity of the individual dentist in solving this problem. He cannot accept, as correct, a theory which he does not know.

***Honorary Degree, LL.D., University of
Toronto, Conferred upon Dr. J. B. Willmott.***

AT the annual commencement exercises of the University of Toronto, held during the afternoon of Friday, June 5th, the honorary degree of Doctor of Laws was conferred upon the following gentlemen: the Vice-President of Queen's University; the Dean of the Faculty of Arts, University of Toronto; the Chancellor of Victoria University, and the Dean of the Royal College of Dental Surgeons of Ontario.

The dental profession will be glad to learn that the

University of Toronto has thus honored the Dean of Dentistry of the Province of Ontario. During over fifty years of active dental practice Dr. Willmott has continually labored for the advancement of the dental profession, and today is justly regarded as the Father of Dentistry in Canada.

Dr. Willmott's untiring effort in the interests of the University of Toronto and of education in general make it particularly fitting that his many years of faithful service in the Department of Dentistry should be thus recognized by his *alma mater*.

Our sincere congratulations to James Branston Willmott, the dental profession and the University of Toronto!

The Young Graduate.

CHE June issue of the *Dental Review* refers editorially to the fact that this is the time of year when educational institutions are turning out their annual product of graduates. Referring particularly to dental graduates, the article continues:

"For good or ill, for weal or woe, many young men are entering the profession to leave their impress upon it. The nature of that impress will be largely influenced by the trend they take in the early years of their practice, and the direction of that trend will in no small degree be due to the example set them by older practitioners, and by the treatment accorded them by these practitioners. Every man who has been some years in practice should aim to interest himself in the young men who are just entering the ranks. The right hand of fellowship extended to a young practitioner is a wonderful incentive to right doing, and many a time it has been the turning point of his professional career. A cordial encouragement extended from the older to the younger man does the older no harm and the younger much good, and too frequently this encouragement is withheld merely through thoughtlessness. It never occurs to the older man how much it may mean to the younger to receive a little attention at his hands."

This is good sound brotherly advice, and if carried out by the older practitioners would not only lighten the burdens of the younger members of the profession, but secure the enthusiastic co-operation of the younger graduates in every movement for the advancement of dentistry. Unite the younger men, fresh from college and the study of the sciences, with the older men, rich in clinical experience, and the solution of the problem of the prevention of dental disease will soon be accomplished.

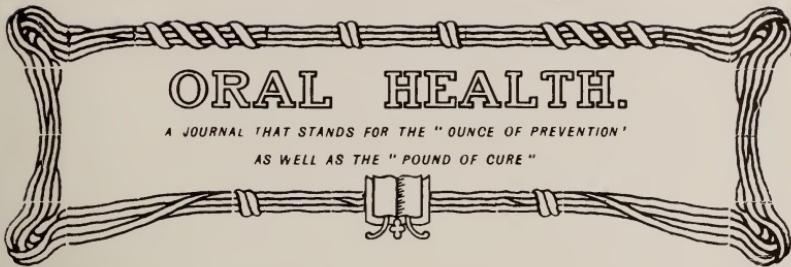
" For never yet has any one attained
To such perfection, but that time and place,
And use, have brought additions to his knowledge.
Or made correction, or admonished him,
That he was ignorant of much which he
Had thought he knew ; or led him to regret
What he had once esteemed of highest price."

William Harvey.



George W. Grieve, D.D.S.

PRESIDENT-ELECT TORONTO DENTAL SOCIETY



VOL. 4.

TORONTO, AUGUST, 1914

No. 8

The Problem of Articulation-- New Considerations.

By DR. ALFRED GYSI,
Professor of Prosthetic Dentistry, University of Zurich,
Switzerland.

Extract "La Revue Odontologique Suisse, Geneva,
Switzerland.

(Translation made by A. H. Dunnett, M.A.,
for Dr. W. E. Cummer.)

FAR from considering the problem of articulation as entirely solved, I propose to pursue its study, because the solutions that have been brought forward, up to the present, do not satisfy me. The present work has no pretence of giving it a definite solution; it is, on the contrary, only one step forward in search of the truth.

I shall set forth here only the practically useful part of the results at which I have arrived. With this end in view, we shall consider briefly the masticatory apparatus of man from the mechanical and prosthetic viewpoint.

The lower maxillary acts like a lever of the third class. All living beings provided with a vertebral column are built symmetrically. Similarly, the lower jaw is divided into a left and a right half. Here we have consequently to deal with a double lever with one arm, and whose two free extremities are reunited under the middle line while the axial extremities are more or less removed one from the other. In the lower vertebrates these axial extremities are brought together, while in animals possessing a higher organization they are farther apart.

In man the two parts of the lower maxilla appear under the form of an equilateral triangle of 10 cm. a side (Bonwill's triangle). The lower maxilla of a human being has

then three chief points whose movements we shall study more thoroughly. At the two posterior angles of the triangle are the condyles (joints) which form the extremities of the axis. The anterior angle is situated at the intersecting point of the four central incisors.

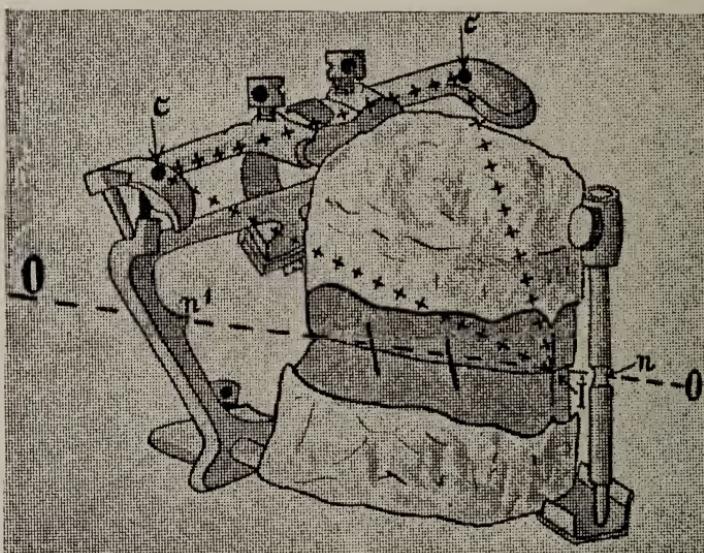


Fig. 1

Nearly all articulators are constructed with this observation taken into account. It is therefore logical, when one marks upon the articulator the position of the models, to use a compass the arms of which are open at 10 cm., so that the intersecting point of its four central incisors (Fig. 1) may be 10 cm. away from the condyles (Fig. 1C) and may be placed at an average height of about 34 mm. lower than the heads of the condyles. This average height of the plane of occlusion (Fig. 10) is shown in my articulator by two protuberances at the back part (Fig 1N) and by a groove in the standard (Fig. 1N). Figure 2 shows the necessity of having the distance between the incisors of the plaster models and the condyles of the articulator reproduced as exactly as possible to what exists in nature.

In the above diagram (Fig. 2), for instance, let us imagine a prosthetic apparatus which in the articulator has been constructed at a distance of 15 units from the condyle. If this apparatus is placed in the mouth of a patient whose alveolar edges are drawn closer than two units from the condyles, the molars alone meet. The contrary will result

when the models are placed too far back; then it is the front teeth alone which meet, and one finds one's self obliged, once the work is completed, to spoil its appearance by correcting the articulation with considerable grinding. If then one wishes to proceed with great exactness, one ought not to content himself with the normal average distance of 10 cm., but one ought in each particular case to measure this distance in some way by means of a face bow or equivalent.

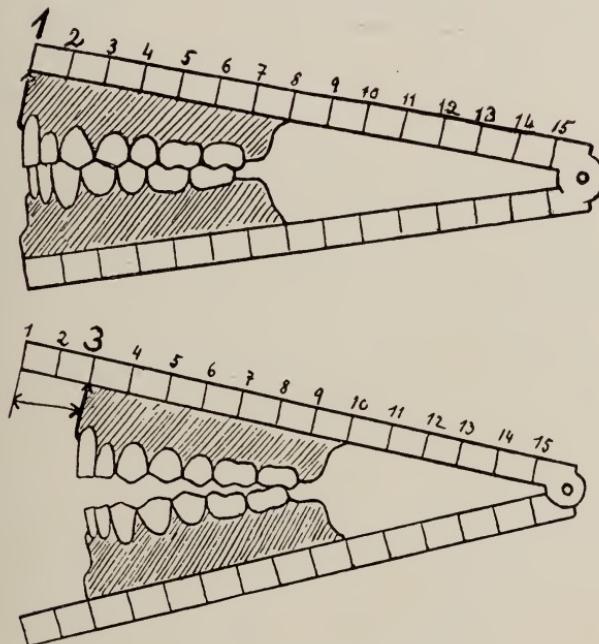


Fig. 2

The lower maxillary being then a double lever with one arm, the tops of the condyles (or axial points) cannot form with the articular cavity an articulation like that of a knee-cap, allowing unlimited movements in all directions. But they represent an average between a knee-cap joint, a hinge joint and a simple slippery surface. In man the condyle of the lower maxillary is not round, like that of the femur for example, but it has the form of a slightly elongated oval, and rests in rather open articular cavity.

With the object of understanding better man's temporomaxillary articulation, we shall examine briefly some temporo-maxillary articulation in the animal series (Fig. 3).

In carnivorous animals the condyles form with the glenoid cavity a simple hinge-like articulation; the lower jaw, during mastication, executes movements only from top to bottom, the condyles are consequently placed transversely.

In the otter the hinge-like articulation is so pronounced that one cannot disjoin the lower jaw without making a fracture.

In ruminating animals, whose lower maxillary during mastication moves chiefly laterally, the condyles are simply placed obliquely. They are concave, and instead of joining in the articular cavities they rub against articular convex tubercles.

In rodents, whose lower jaw during mastication executes movements chiefly from back to front, the condyles are placed longitudinally.

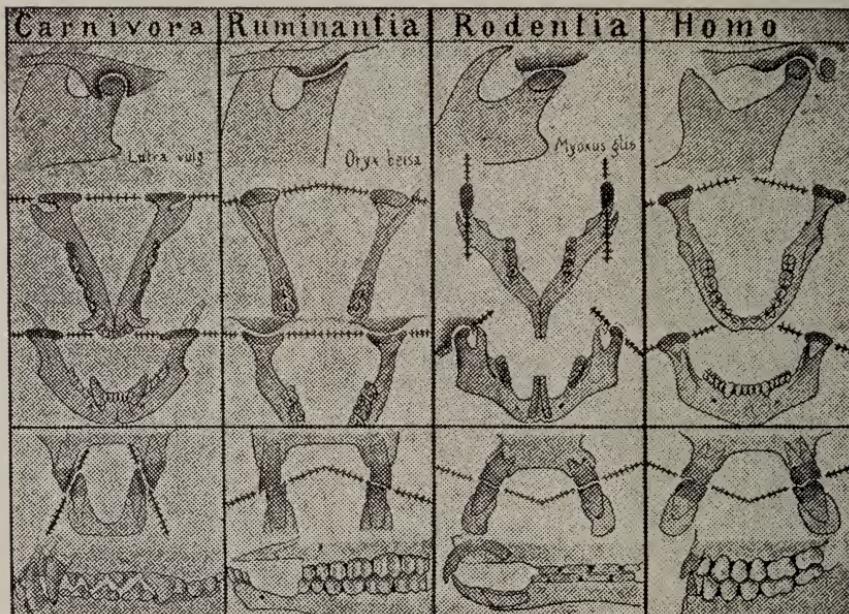


Fig. 3

In man one finds during mastication a combination of these three chief movements. The condyles are placed obliquely with reference to two planes and make an angle with the horizontal as well as with the vertical, that is to say, the condyles of man's lower maxillary are, relatively to the sagittal plane, directed from the top and rear; this oblique position prevents the heads of the condyles, during the lateral movement, from gliding directly forward, as has always been admitted up to the present. I shall return a little later to this point.

The heads of the condyles are oval and convex and articulate with the articular surfaces, of which the posterior half only is concave, while in carnivorous animals and rodents the whole surface is concave. The anterior half of the articular human surface is convex (articular tubercle). In ruminating animals the whole upper articular surface is convex.

In the ruminating animals all the upper articulator surface is convex, the form of the lower human maxillary, consequently its movements are the most perfect one can see within the living animals. Man can therefore, indeed, make the following movements, opening and occlusion, as in the carnivorous animals. The mechanism is then like that of a hammer and an elbow. During those movements it is specially the bicuspid teeth which contribute, by movements of crushing in sections, to the comminution of the coarser pieces of food. Secondly: In regard to the movements forward and backward, as in the rodents, the mechanical effect is then like pinchers or a pair of scissors. During these movements it is specially the incisors and the canines which, by working in sections and tearing up the food, produce the comminution of fibrous food. Thirdly: In regard to the horizontal movements, like those in the ruminating animals, the mechanical effect is then like the wheel of a mill. During these movements it is specially the molars which, thanks to their large surface, execute the work of breaking more completely and serve to reduce to pulp the elements of food, and especially the soft vegetable substances. In dental prosthesis an endeavor has been made for a long time to imitate these three movements and their combinations. In this instance an articulator instrument is used which serves to facilitate the construction of an accurate denture of the three groups of teeth, in order to allow the apparatus to execute the complex movements of the human mastication and to enable it to utilize their three different styles of movements showing the three groups of teeth. The hinge-like articulators, which are unfortunately still in use in about 80 to 90% of the dental offices, do not imitate accurately the movements of mastication, because they only allow the movements of opening and occlusion such as the carnivorous animals perform. The joint of the prosthesis apparatus, constructed in this manner, will then reproduce it to those movements only, which are not sufficient to assure either the comminution or the salivation of the food of vegetable origin. Our stomach does not bear, for any length of time, without feeling very

fortable, food which is insufficiently masticated. To construct, therefore, an anatomical articulator, which is very accurate, is not then a very easy task, because, since Bonwill made known in 1865 the first of the articulators permitting some lateral movements, since then many endeavors have been made to reach perfection.

If the research has been so difficult it is that they did not know the real movements performed by the three points of the triangle of the inferior maxillary of man during mastication. The first man was Bonwill who noticed that the masticating movements of the condyles of the inferior maxillary did not only perform a movement of rotation. He thought to have discovered that they glided backward and forward (Fig. 4). It is that which explains the horizontal movements of his articulator.

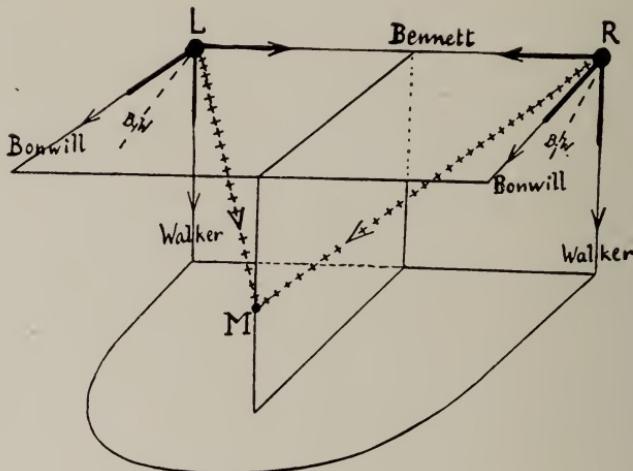


Fig. 4

In 1896 Walker discovered that the condyles glide also from top to bottom (obliquely) and vice versa in performing a movement which combines with that of Bonwill. It is this which determined Walker to construct an articulator allowing the movements in front and bottom and vice versa. (B. W. Fig. 4.) Bonwill and Walker both thought that this front movement of the condyles was performed in a straight line (Fig. 4). In 1908 I succeeded in constructing an articulator in which this movement worked in the form of a curve, resembling, more or less, an S. In the same year Bennett, of London, discovered that the condyles make another movement, which is trans-vertical (Fig. 4), movement which combines with those discovered by Bonwill and

Walker, so that a diagonal movement of the condyles is produced, with the lateral movements, that is to say, when the real movements of mastication take place. That is the very reason of the very great importance that it has from the practical point of view of the prosthodontist. If one considers the two posterior points of the triangle of the inferior maxillary from the top during a natural movement of opening the mouth (Fig. 5A), and whilst the top of the chin lowers itself, at the same time the two articulator points go parallel forward and downward, that is to say, the transvertical movement of Bennett is not performed simply during the downward movements. On the other hand, in the

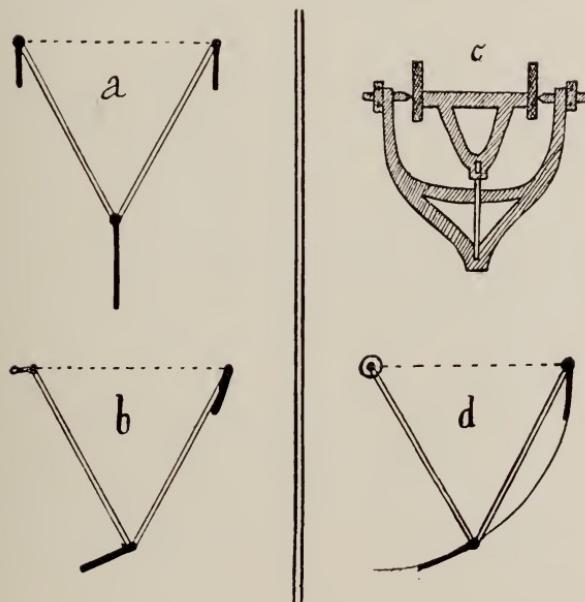


Fig. 5

lateral movements (Fig. 5B), that is to say, when the top of the chin moves, say, for example, on the left, the right condyle does not form an arc round the left condyle, which remains still as Eltner still believes to-day (Fig. 5D). In a lateral movement leading the top of the chin to the left (Fig. 6), the right condyle (B, Fig. 6) does not come forward parallel with the median line directly forward and downward, but also makes, moreover, movement inside, of 5° - 30° , the average being generally of 15° (Fig. 6). The consequence is that the left condyle (A, Fig. 6) is forced back a little on the left. That is the lateral movement discovered by Bennett. From this discovery that the

condyle passage, during the movement of mastication, does not work its way only circularly and directly forward and backward, but it performs still a movement more or less trans-vertical, with the result that the condyle passage is less inclined than one has believed it to be until now. The best way to understand what takes place is to imagine two streets, one ascending a hill directly, whilst the other rises obliquely by a gentle incline on that very same hill (that is to say, the articular tubercle). If then one wants to determine the passage performed by the condyles on the articular tubercle, either with my recorder or by the means of the same apparatus arranged by Eltner, one must make the patient perform lateral movements of mastication, because with simple movements of opening and shutting the mouth one only obtains the most abrupt condylian passage, which for the prosthodontist cannot be of any use. It is for this rea-

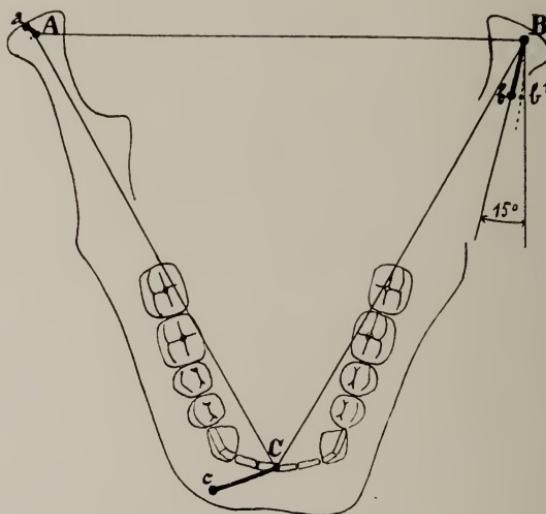


Fig. 6

son that the methods of measuring the condylian passage according to Christensen or Snow are inaccurate, because one obtains by these means only the inclination that one notices during the projecting of the maxillary. One would not record then the real inclination of the condylian passage except when the trans-vertical movements are small and that the condyles follow about the same way on the articulator tubule as in the lateral movements as in the movements of projection.

It is because of these lateral movements of the condyles that, in an articulator which has some pretension to accurateness, the condylial passage must not be directed parallelly forward (Fig. 5C), because in this case the trans-vertical movements are impossible. It is just what happens, for instance, in the Eltner articulator. It follows, then, from the existence of these trans-vertical movements, that the articulation point does not necessarily constitute the point of rotation (Fig. 5D), as has been believed until now. But then where can we find the point of rotation if it is not situated in the condyle itself? Bennett has had recourse to the following experiment. He determined by the optical

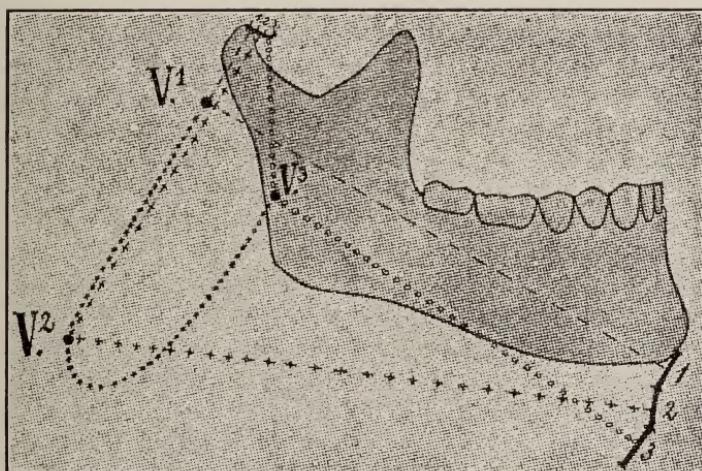


Fig. 7

method simultaneously and on the same and only vertical surface (for example, the membrane of the mouth) the outlines which perform the three points of the triangle of the inferior maxillary. He noted thus, of these outlines seen sideways during a simple movement of the opening of the mouth whilst they themselves registered on a horizontal plane (the roof of the mouth, for example), seen from the top, the outlines of the lateral movements.

I have repeated these experiments with the help of a colleague, Steiger Junior, not only by the optical method of Bennett, but also by a direct graphic method, and my experiments by these two methods absolutely confirmed the results obtained by Bennett.

Until now they have erred in considering only the movements of the top of the condyles without heeding the movements around the chin, or then universally they have studied these latter ones without taking into consideration the condyle passage.

I will not tire the reader with a description of all the apparatus that have been used in experiments, but I will only give the results of my researches. The outlines of the movements of the condyles and the movements of the chin are recorded simultaneously by this process, and show themselves in the form of an S, but not very accentuated. They were designed by us in three sections, so that each of these sections apart may be considered as a line nearly straight (Fig. 7). If one raised a vertical on the first section of the condyle passage and another vertical on the first section of the passage of the chin, the point of intersection of these vertical lines will constitute, naturally, the general point of rotation of the two sections (Fig. 7). It is thus they proceeded for the two subsequent sections, and on this occasion we made the most surprising discovery, that the point of rotation is submitted, during a movement of a short opening of the mouth, to a considerable upheaval. This discovery made Bennett declare that it would be always impossible to make an accurate anatomical articulator possessing consequently a point of ambulatory rotation. However, I did not let myself be discouraged by this assertion. Indeed, in the setting up of a prosthetic restoration, it is only the common point of rotation of the first stage that it is necessary to take into account, while the more extended movements of the opening in the second and third stages are without influence on the position to be given the teeth and because this first stage of the passage of the chin suffices amply to determine, during the mounting of a piece of prosthesis, how much it will be necessary to raise or lower the articulation.

Of the three stages of the whole condylarian passage, there is no reason to trouble one's self about the construction of a prosthetic apparatus, except in stages 1 and 2, because the lateral movements of mastication do not require more than half the width of a molar. It is not then necessary to reproduce on an articulator the points of rotation (Fig. 7, V² and V³). The centre, V¹ (Fig. 7), is sufficient, because this second stage follows in a manner sufficiently exact from this centre, since the radii of the latter are in a similar direction.

The centre of rotation with which the prosthetic operators ought to concern themselves is then half way up between the plane of occlusion and the head of the condyle and about 1 cm. to the rear.

After a condylian passage and a passage of the chin have been given (Fig. 8) we can infer the movement of any point whatever of the lower maxillary. We then ascertain also what it is behind and under the head of the condyle that produces the feeblest movement.

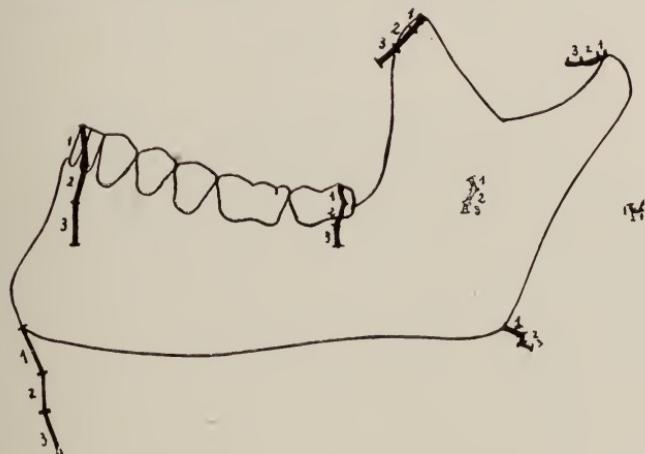


Fig. 8

One can show the exactness of this point of rotation of Bennett by fixing to a skull, in that part, a resisting plane and to the lower maxillary a hinge half way up between the occlusal plane and the condyle head and 1 cm. back (Fig. 9). If one then works the maxillaries, the condyles make a very natural forward and lowering movement. But one knows this movement is not produced spontaneously unless one draws the maxillary forward.

In the construction of a prosthetic apparatus, as long as the height of articulation is the same, it is a matter of indifference whether the point of articulation of the articulator is situated exactly or not. This happens in all partial pieces because here the height of articulation being determined by the natural teeth, consequently remains invariable.

However, in the setting up of an apparatus complete from top to bottom, it can happen that one decides in the course of the work to raise or to lower the articulation. This result can also happen through inadvertence. If the

articulation lowers it is generally on account of the plasticity of the wax in which the porcelain teeth are mounted. In this case it is important that the articulator should have an exact centre of articulation (Fig. 10B and Fig. 11, V¹), so that the incisors run through the line b-B (Fig. 10), while the incisors are not drawn too far forward in the direction of a, so that the latter is produced into the articulators, whose point of rotation is in the condyle itself (Fig. 10A, Eltner's Articulator), or too far back in the direction of c, when the centre of rotation is at the height of the plane of occlusion (Fig. 10C, Kerr's Articulator).

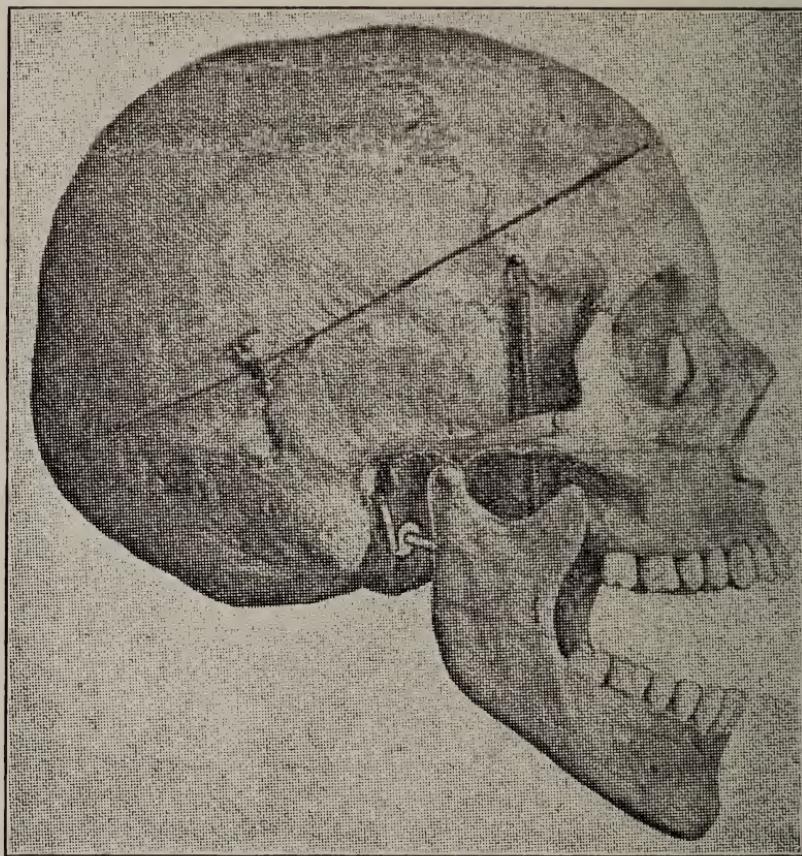


Fig. 9

The reason why the very complicated masticatory movements which the human lower maxillary executes have remained unknown so long is that it is not possible to detect

in the man who is chewing any lateral movement similar to those of the ruminants for example.

For this reason the anatomical articulators, although their discovery dates from 1865, did not succeed in supplanting, even to a certain extent, the hinge articulators. The dentists then claimed that it was quite useless to employ anatomical articulators to place the teeth in such a manner as to make possible the lateral movements, since man, differing in that respect from ruminants, does not execute such masticatory movements.

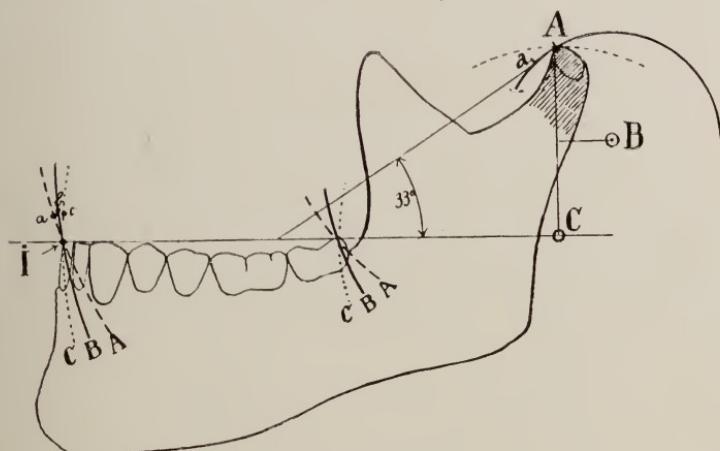


Fig. 10

This last point of view is, after all, correct to a certain extent, since man makes, after the manner of ruminants, only half of his masticatory movements, as we shall see farther on. Nevertheless, if the porcelain teeth are mounted on an anatomical articulator so as to render possible in their entire development, alternately from left to right, the grinding movements which the ruminants execute, the holder of the apparatus will also be able without trouble to execute the masticatory movements of man. Here then is what will take place:

When the lips are closed the maxillary is slightly open. It will produce in the bucal cavity a lowering of the atmospheric pressure, if the exterior atmospheric pressure should not force back the cheeks inwards, which results in pushing the bolus against the dental arches. Then the lower maxillary makes in closing a little side movement, which the observer does not see at all, and the teeth meet in the position of contact, cusp against cusp.

During this movement of occlusion (Fig. 20) the tender parts of the foods are crushed like fruits in a fruit press, so that only the tougher fibrous parts remain between the teeth, whilst in this position of lateral occlusion the dental arches meet on the greatest possible number of points. Then the teeth slip firmly into their position of normal occlusion (Fig. 18), the points into the grooves, and only this part of the masticatory act is capable of grinding the toughest fibres, which then become easy to swallow. In order that this movement may be possible, it is absolutely indispensable that the teeth should be placed in such a way as to allow the movement of gliding sideways.

Proceeding from this position of occlusion, man again repeats the masticatory movements I have just described, that is to say, the maxillaries open a little, etc.

During recent years divers articulators with their measuring apparatus have been constructed by Walker, Parfitt, Christensen, Amoëdo, Snow, Gysi, Luce, and Eltner. These instruments permit the determining for each patient of the conditions in which the movements of the two posterior points of the lower maxillary triangle are executed, and of marking these movements on the graduated scales of the articulator, which permits the most exact imitation possible of the individual movements of the maxillary.

It was, however, difficult enough to understand how to effect these slightly complicated measurements. This method had only been demonstrated in a very few dental schools, and its introduction into daily practice consequently encountered great difficulties.

It is for this reason that I have endeavored, independently of the articulator that is adapted to each particular case, and whose employment requires the determination of diagrams of the patient, to construct also, while keeping track too of the most recent anatomical discoveries, another articulator possessing no movable part adaptable to individual cases, and which consequently does not require one to take any measure of the patient. All the important parts of this apparatus have been constructed after data was obtained by taking the average of a large number of exact measurements.

This articulator then is, in the greatest number of cases, sufficiently exact, and, moreover, it is as easy to handle as a hinge articulator. After having overcome the difficulties of mounting the teeth, the prosthetic operators, who in some

abnormal cases desire greater exactness, ought to make individual measurements and to make use of an articulator adaptable to each particular case, such as the one I have constructed, keeping track of new discoveries.

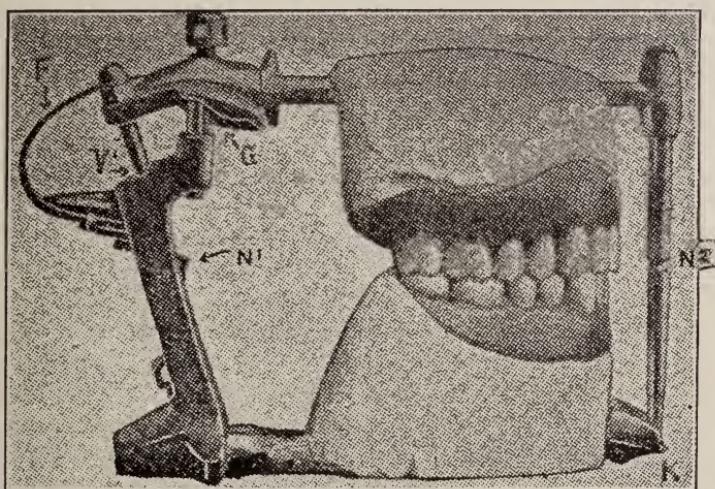


Fig. 11

Exact measurements have shown that Bonwill-Walker's movement, forward and downward (Fig. 11G), makes, while acting, an average angle of 33 degrees with the plane of occlusion (Fig. 11 N¹—N²), and that Bennett's interior movement in the lateral movements, less than an average angle of 15 degrees (Fig. 12G), with reference to the direction of the directly forward movement which is produced at the time of opening.

Figure 11 shows the common articulator (Gysi Simplex) viewed from the side. The protuberance N¹ and the groove N² show the horizontal plane on which ought to be placed the surface of occlusion of the wax models with which the articulated object has been taken (height of the plane of occlusion). At V¹ is the point of rotation for the eventual raising or lowering of the original height of articulation. At G one sees the glenoid cavity directed forward and downward with the articular tubercle. At F is a strong spring which brings back the articulator into position after the movements, and which prevents the articulator, once open, from closing spontaneously. At K is the conducting surface in the region of the chin, and which promotes the intersection of the incisors. Figure 12 shows the upper

part of the articulator viewed from above. One sees the glenoid cavities, G, G, inclined about 15 degrees inwards, as well as the shaped articulator cavity.

It is not possible in the articulators already existing, provided with parallel plates of articulation, to determine the point of articulation discovered by Bennett, a point movable laterally moreover, nor the transversal components of the movements of the condyle described by this same author.

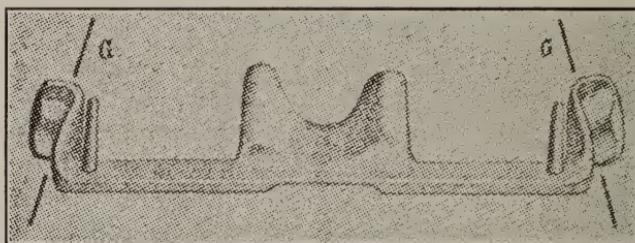


Fig. 12

The practical solution of this problem, which now appears so simple, presented in reality the greatest difficulties, and it was only at the price of numerous and costly attempts, taking up considerable time, that the end aimed at was finally attained. When I had realized the simplest solution possible, I perceived, to my great surprise, that I was finding myself again at my starting point; then that thirteen years I was constructing with Eug. Müller, by entirely empirical methods, the first anatomical articulator provided with natural glenoid cavities, with this exception, nevertheless, that now the whole construction rests on true scientific principles whose practical, though still not the most important application, is realizable by very simple mechanical means.

Another surprise still was reserved for me. The present work was ready for the press when I received, on June 19th, 1912, from an English contemporary, M. F. H. Balkwill, L.D.S., a copy of a work published by him in June, 1866; now it is consequently 46 years, and nearly another year after that Bonwill made known his articulator. This work only consists of 26 finely printed pages, and contains only 8 figures, but in it one already finds *all* that which in the course of the last 46 years has had to be found again, painfully scrap by scrap, by those who have studied the problem of articulation. Balkwill already described the components

directed forward, downward and sideways, of the articular movements, discovered separately by Bonwill, Walker and Bennett.

Balkwill described exactly the relationships of the articular tubercles of the molars, the curve of compensation of the dental arches, the function of the grooves of the enamel, of the triturating surfaces operating like canals of evacuation for the alimentary bolus already reduced to pulp (clearance spaces). Then the pyramidal shape of the cusps of the molars, the inclination of the heads of the condyles, the function of the canines, like guides going on before the movements of the maxillary, the angle formed by the crossing of the four central incisors and the heads of the condyles. Besides these principal points, he had observed a great many details which have only been rediscovered recently.

With all the information that Balkwill possessed he should have been able then, 46 years ago, to construct an exact anatomical articulator; his memory would have obtained then great celebrity instead of remaining buried in the reports of the meetings of the Odontological Society of Great Britain.

However, as we all know the problem of articulation is so complex that it is not possible in 26 small pages, accompanied by 8 figures, to make anyone whatever, who has not on his part devoted himself to personal researches, understand it. That is why Balkwill's publication has not left any lasting traces. Prosthesis at that time was not yet sufficiently advanced for people to comprehend the importance of these discoveries or to employ them in practice.

I can nevertheless congratulate our brother Balkwill in so far as he has been permitted, though slowly, to see his researches confirmed, and that he has not experienced the fate of Mendel, the discoverer of the law of heredity which bears his name, whose labours were only appreciated after his death.

Balkwill can also console himself on thinking of the fate of Bonwill. The professional journals of America, indeed, refused to publish the first important and complete work relative to his method of articulation, which Bonwill had presented to the Dentists' Society of the State of Delaware, as well as a later work that he had read in 1885 before the American Dental Association. It was only a short time

before the death of the unnoticed author that Dr. R. Ottolengui opened to him the columns of the journal *Items of Interest*. In the September and December numbers of this publication for 1899 there at last appeared a large number of illustrations, showing Bonwill's method. Only the satisfaction of thus seeing justice done to himself by Ottolengui could somewhat mollify the cruel disillusionments of Bonwill, who, moreover, did not have the joy of seeing his entire work published, death having carried him off September 24, 1899, when only the first part had appeared. Bonwill only stirred up a few adepts, and only those who under his personal direction had fathomed the problem of articulation were able to understand it and to turn it to account in practice.

The great majority of dentists looked upon the discoveries of Bonwill as fantastic lucubrations. For them the only movement which the lower maxillary could execute was the hinge movement, because it is a matter of fact, as will be shown later, that in a man who is chewing there are no lateral movements visible.

APPENDIX.

CONCERNING THE QUESTION OF THE POINTS OF ROTATION.

Until now it has always been believed that the moment one could succeed in finding the true position of the points of rotation (or the axis of rotation) around which the lower maxillary moves during the masticatory movements it would be child's play to construct an anatomical articulator that would faithfully reproduce the movements. Each investigator, or nearly each one, found a different point of rotation, some above, some behind the condyles, some in the condyles themselves. And when, finally, one could agree upon an approximate position, one debated still in order to find out whether the real position was 10 or 2 mm. from the condyles.

My last researches have shown that nearly all the data upon the position of the points of rotation were correct up to a certain point, because this point of rotation was perhaps placed indeed above, below or behind the condyles, that that one, moreover, at distances varying considerably.

This practical result has followed, that in the construc-

tion of an articulator it is not at all necessary to worry one's self about the points of rotation; it is enough to fashion anatomically exact conducting surfaces of the two condylian extremities of the lower maxillary and of the chin section.

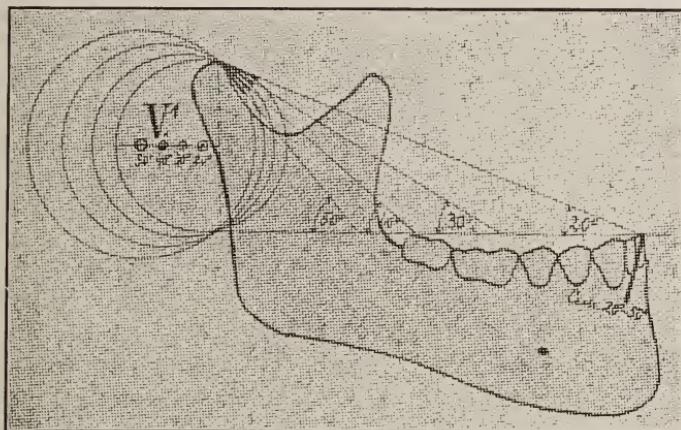


Fig. 13

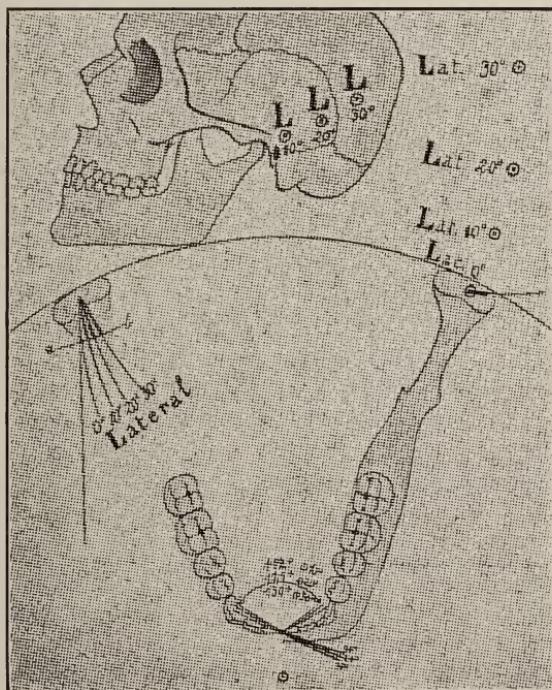


Fig. 14

The different points of rotation work entirely independently during the movements of the articulator around these three conducting surfaces. Geometrical points of rotation



Fig. 15

are then produced (which are not real anatomical points) outside the conducting surfaces, just as in nature.

We have then at the beginning learned that the masticatory movements of man are the same as of the carnivorous animals, of the ruminants, and of the rodents, that is to say, that man's lower maxillary can move vertically (from high to low and from low to high) as well as laterally (from one

side to the other), that it can move forward and backward, and finally again diagonally, that is to say, according to the resultant of the three movements. In each of these three chief movements one can find a centre of rotation.

1. Centre of rotation for vertical movements.

If during a purely opening movement one determines the direction of the path into three parts, and if one erects on each part a vertical, the intersecting points of these lines

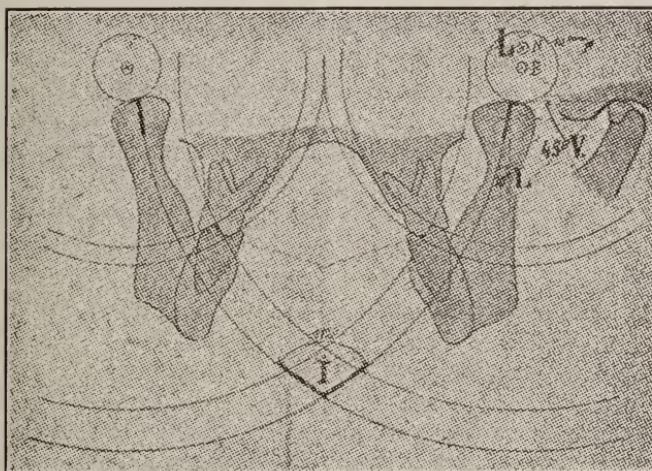


Fig. 16

then form the points of rotation. The result is that during the opening movements the point of rotation moves about and can be found anywhere on the dotted line. These centres of rotation cannot consequently be reproduced on an articulator, at least not in a practical and simple manner.

That, moreover, is not necessary, because the opening and closing movements are, in man, without influence on the position of the teeth.

It is only for the raising or lowering of the articulation (height of articulation) that the centre of rotation of the first stage of the condyle chin course can perhaps be employed practically. And it is the only centre of rotation which may be produced mechanically in my articulator.

As one sees it in Fig. 13, this centre V¹ is always more or less behind and above the head of the condyle, according as the angle of the condylian course in the plane of occlusion is 20, 30, 40 or 50 degrees. As a great number of measure-

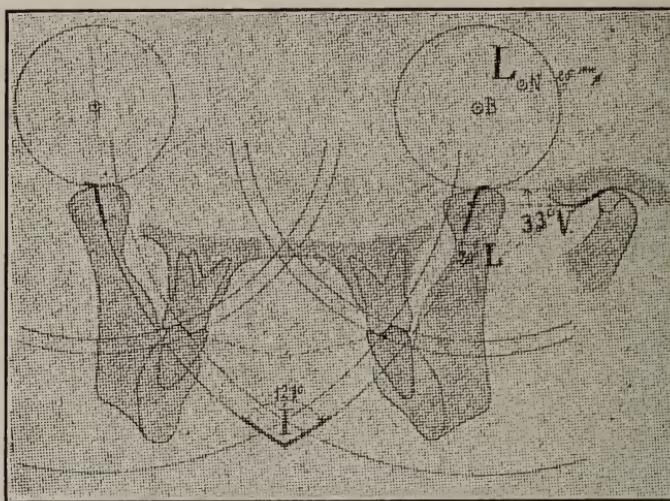


Fig. 17

ments have proved that one encounters the angle of 33 degrees most often, the angle that one can consequently designate normal, this centre of rotation in my Simplex model of an articulator is fixed at 33 degrees.

This centre ought to be given mechanically to the articulator (Fig. 11V¹), because it is independent of the conducting surface of the incisors (Fig. 11K), and in nature it is only produced by muscular traction exercised in different directions, an arrangement that cannot be easily reproduced mechanically.

2. Centre of rotation for lateral movements (in every direction).

As we have seen in the explanation relating to Figure 6, the three points of the triangle of the human lower maxillary describe during a side movement the following movements: If, for instance, the chin point placed at C moves toward C, the head of the condyles moves toward B, that is to say, within (and not towards b', as has always been believed up to the present). By this movement the head of

the condyle A is also pushed sideways towards A. If one describes on these three stages of the course vertical lines,

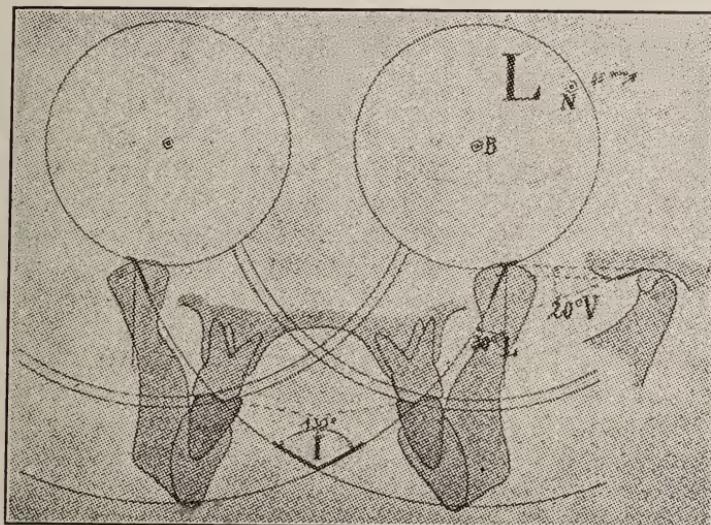


Fig. 18

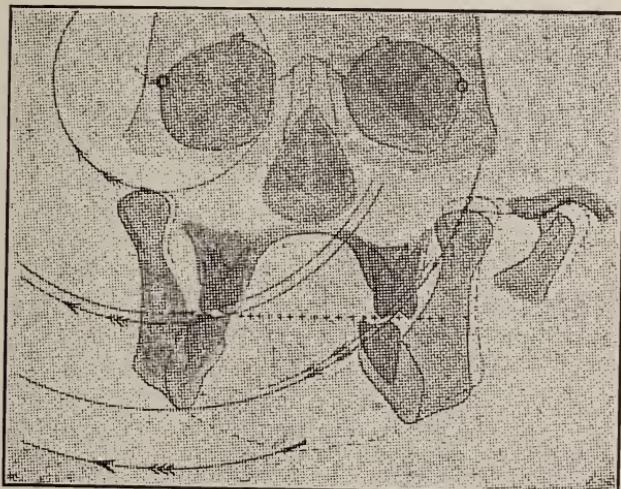


Fig. 19

the intersection of these lines will produce the corresponding point of rotation. The latter is situated near these given lines behind and above the heads of the condyles

(Fig. 14) and following the length of the lateral movement, it is found near the points L 10°, L 20°, L 30°. The position of this point of rotation is determined then by the extent of the lateral movement. A very large number of measurements taken from patients as is indicated by Figure 15 (on a ground glass) has now established that this forward movement averages about 15° (Fig. 6).

When then, in my Simplex articulator, the glenoid cavity (Fig. 12G) is in this position, this point of rotation, situated behind and above, is determined by this same fact. It is not then necessary to ascertain it directly by a mechanical act. And as the point of rotation for the opening vertical movements, which alone is reproduced in the articulator (Fig. 11V¹), can move sideways for the lateral movements (since

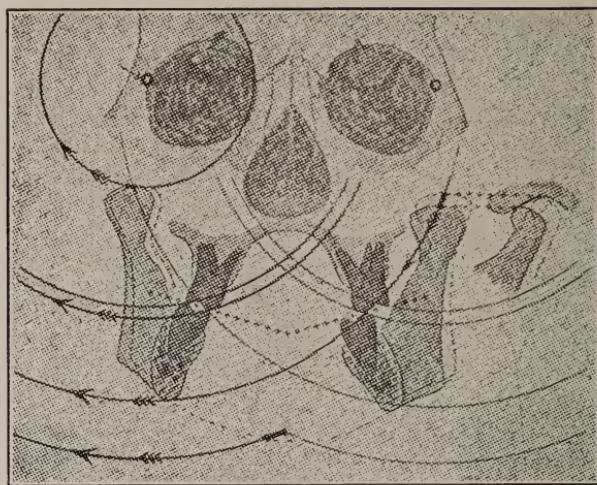


Fig. 20

it is not on a hinge), it does not present the establishment of a geometrical point of rotation (Fig. 14L) for lateral movements.

Figures 16, 17 and 18 show with what exactness one can, by means of reconstruction and by relying on the points of rotation, establish occlusion surfaces of molars of various depths, that is to say, occlusion surfaces with cusps more or less marked, and how in consequence it results that in one part of the condyle path V there is an inclination varying from 20 to 45°, and also condyle paths inclined more or less sideways, making angles from 10 to 30° L. One also

sees how the angles of intersection I are produced, characteristic curves, angles whose opening varies from 112 to 130° , such as are produced by using my register, for the incisors movements, described in a preceding work.

The critical reader will kindly notice at the very first that for these plans upon a plane surface one ought to select other centres than those which result from Fig. 14. Indeed, the centres in Figs. 16, 17 and 18 are placed in B upon the plane of the figure. But the true centres for the movements in space, that is to say, the movements of the dimensions, are respectively at 10 mm., 25 mm. and 45 mm. behind the points N of rotation in the space of Figs. 16, 17 and 18, then in L of Fig. 14. It is from these plans that the position is still deduced, inclining naturally from the triturating surfaces of the molars, and one consequently ascertains it as this inclination depends on the length of the lateral movement of the condyles' heads.

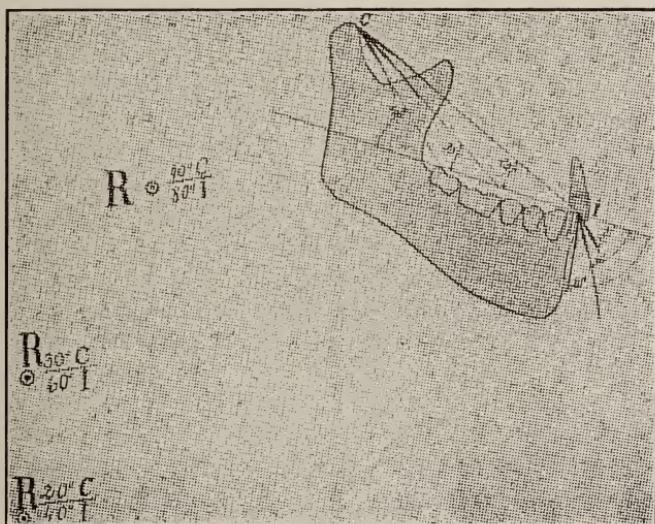


Fig. 21

Fig. 19 also shows how, by this position of the points of rotation, by the inclination of the triturating surfaces, the contact between the tubercles of the molars during the lateral movements of mastication remains assured, which has the effect of preventing the restoration from swaying.

If the triturating surfaces of the molars are placed on a horizontal plan, as in Fig. 20, the tubercles of the molars cannot remain in contact with the two halves of the maxillary.

3. Centre of rotation for gnawing movements (forward and backward).

The movements which man makes in order to gnaw are determined by the position of the glenoid cavity and by the inclination of the palatal surface of the upper incisors, an inclination which can admit of 4 to 80° in relation to the plane of occlusion.

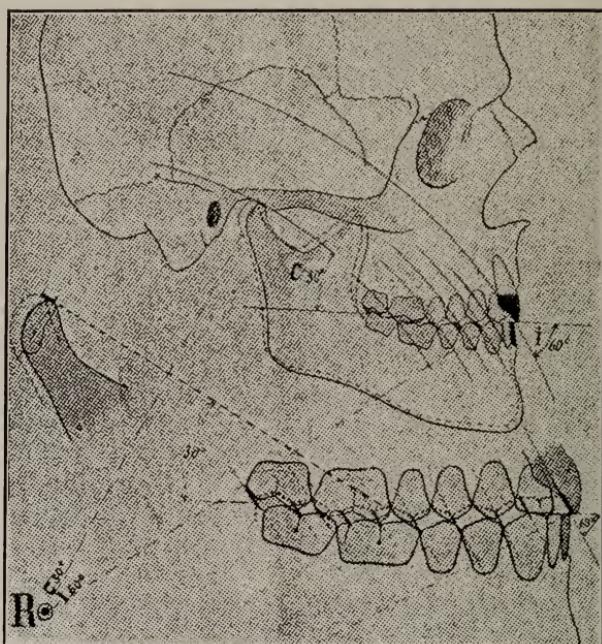


Fig. 22

If one takes the three chief inclinations of the condylian passage C (Fig. 21), suppose they be 20, 30, 40°, and also the three passages of the incisors 1, suppose they be 40, 60 and 80°, one can ascertain from this data three different positions (R, Fig. 21) of the corresponding centre of rotation situated in the middle plane, providing one admits that normally the passage of the incisors always has double the inclination of the passage of the condyles (Fig. 21).

If one makes still other inclinations that are more normal than those preceding, one can obtain many other positions for the point of rotation of the movements of prehension with the incisors.

Theoretically it would hardly be possible to add to an articulator an arrangement that would reproduce mechani-

cally those points of rotation situated very far back in the sagittal plane. One achieves this object in an extremely simple manner by giving the glenoid cavities a suitable inclination and by placing in the chin region an inclined surface on which a rod is slipped. This rod which connects the upper part of the articulator during movements of pre-hension, with the incisors as well as during lateral movements of occlusion, directs these movements following the natural inclination or one a little weaker, an arrangement which I have been the first to apply when I have added to my articulators the inclined surface (Fig. 11K) in the chin region.

One sees in Fig. 22 how, in gnawing with the incisors, a movement during which the condyle path C has an inclination of 30° , with the plane of occlusion and the passage of the incisors an inclination of 60° , the directions of the movements of the other teeth settle near the centre R of the movement of prehension of the incisors, and how the molars place themselves in the position of tubercles against tubercles in order to assure the contact, and consequently the stability, of the prosthetic apparatus. (If, for instance, a piece of *zwiebak* is taken between the incisors, the contact of the molars is naturally destroyed, and to assure the stability of the apparatus in a strained position like that the incisors ought not to stand out too much on the alveolar edge, or indeed one makes instead of the second molar an inclined Eltner plane that one can set up in using any anatomical articulator whatever.)

In Fig. 23 I make all these different centres of rotation visible, by placing them at the ends of metal rods fastened to a lower maxillary, and I denote the different passages of the condyles and of the incisors in relation to these centres by heavy lines and suitable letters. On account of the different combinations of the three chief kinds of movements of the lower maxillary, combinations also of the centres of rotation are naturally produced, which renders the mechanical reproduction of the latter still much more complicated.

That is why I have chosen for my simple articulatory only weak opening movements (V, Fig. 23). All the remainder are produced in an entirely automatic manner by the triple inclination of the glenoid cavities forward, downward and inward, as well as by the directing surface in the region of the chin.

This directing surface inclined for the incisors is invariable and fixed at the average inclination determined by experience, about 30° . In the case of incisors placed in the maxillary, nature can permit of inclinations of the palatal surfaces going almost to 80° . The prosthetic operator nevertheless would commit a very serious error in desiring to copy nature slavishly in all these points, because artificial teeth are not placed in the maxillaries, but rest more or less freely on the reabsorbed alveolar edges. They are, consequently, easy to displace.

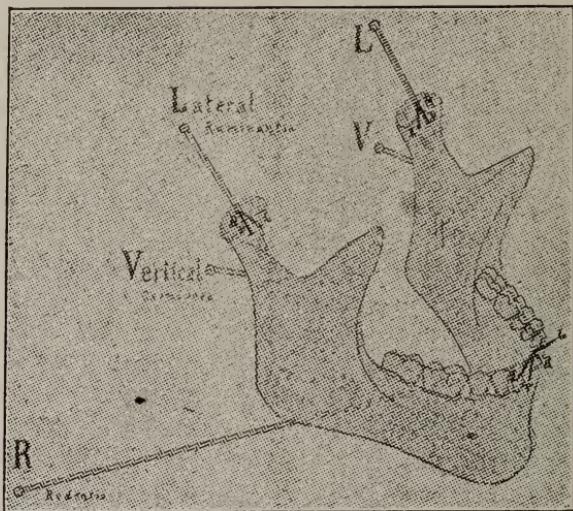


Fig. 23

If the upper and lower incisors meet in a greatly inclined plane, a resultant of pressure occurs, directed very much forward, which pushes the lower piece back or the upper forward. Then the flatter the upper and lower edges are, the less deep and less steep must the incisors intersections be (Fig. 24). In all cases one ought to avoid in the complete dentures an intersecting surface as abrupt as one encounters sometimes in nature.

It is the same for the molars. Only good, well-marked alveolar edges allow the use of molars with accentuated cusps, and even when their cusps are low the teeth ought to be arranged in such a way as to permit a united and uninterrupted sliding, or at least they ought to allow the holder of the apparatus to gnaw not only in the sagittal plane, but also to gnaw a little sideways to the left or to the right.

In all cases the intersection of the incisors ought to be in harmony with the height of the molar cusps, that is to say, the alveolar flat edges permit only molar plates and little intersection of the incisors (Fig. 24B). Raised alveolar edges will allow molars with accentuated cusps a little more intersection of the incisors (Fig. 24A).

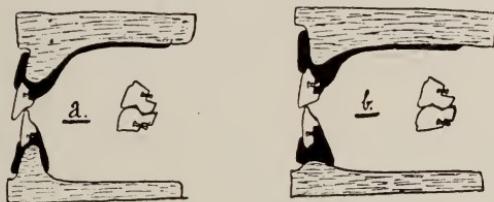


Fig. 24

With this end in view one can fasten with some wax upon the inclined plane of the articulator (Fig. 11K) a piece of metal plate, which gives it a greater inclination according to the degree of the incisors' intersection desired. As one can infer from these brief statements, each prosthetic piece (were it even a simple gold crown or a tooth on a pin) ought to be constructed by observing the laws of statics and by adapting them to the special conditions of the mouth of the patient operated on. The possession of an articulator constructed on correct principles does not in itself alone logically guarantee the production of well-constructed apparatus. It is the same here as in photography. A good apparatus is not sufficient to make a good artist. On the contrary, it is still necessary on the one hand to use plates suitable for the given work, and on the other hand to possess knowledge of weather, of position suitable to each case, etc.

We dentists still need teeth of proper form. Since my first publication all the manufacturers of teeth have indeed placed on the market new forms of molars. It is only a question of a period of transition leading to more perfect forms. I hope that in the course of a year it will be possible to put on sale the forms that I myself have had made.*

I do not wish to repeat here the rules to be used in the mounting of artificial teeth, because I have already described them and they are incorporated in the method of employing articulators.

*These are now obtainable.

Gum Chewing.

CHE gum chewing habit has little to justify its existence other than printers ink and the ingenuity of the copy writer. From the hygienic standpoint it is injurious; socially it is impossible; economically a flagrant waste and mentally a distraction.

Gum chewing has been presented to the public as an ally of good health. The cure-all copy-writer has done his work well, having covered the field from "sick headache" to "indigestion" and "prevention of dental decay." The manners, morals and health of the people, however, would be greatly improved were chewing gum entered upon the prohibitive list and its makers classified as "non-producers." This habit is as useless as it is disgusting and has no claim whatever upon good society.

Recently a home of wealth and culture was pictorially presented to public gaze with the host faultlessly attired and passing to his guests chewing gum as an after dinner confection. The manufacturer endeavoring to make gum chewing the "proper thing" socially, places himself in a ridiculous position.

If mother nature had intended the human species so to chew she would have supplied the wherewithal, and the very absence of this may be taken as sufficient evidence that gum chewing is not essential to good health. It is an unnatural and unhealthy habit which causes an abnormal flow of saliva and entirely upsets the delicately adjusted salivary apparatus. In young children the constant movement of the jaws distorts and enlarges the muscles of mastication and mars the otherwise perfect symmetry of the face.

It is true that thorough mastication plays an important part in the maintenance of a healthy mouth, but gum chewing is but an artificial and injurious method of exercising the teeth. As dentists, let us put all our energy into the advocacy of the natural method of mastication; namely, the proper mastication of properly prepared food.

Pulp Nodules.

CHESSE are calcific bodies of varying shapes and sizes, supposedly the result of secretion, and occurring within the pulp, and are rarely, if ever, attached to the dentine. They are found more generally in middle-aged or elderly patients, whose teeth have been subjected to such continued irritation, the source of which was mentioned as an etiological factor in the formation of secondary dentin. Black, however, observes that pulp nodules may, and frequently do, form in other teeth of the same denture which are not directly involved in the irritation—and that irritation of the pulp of one tooth very frequently causes a general hyperesthesia of the pulps of all the teeth in that mouth, especially is this true of that type of individuals classed as neuralgic.—*J. P. Buckley, D.D.S., Dental Review.*

The Dentist's Hands.

ADENTIST'S hands should be in the best possible condition at all times, the skin soft and pliable, and sensitive to the touch. The best agent to bring about this condition is glycerine, but not used as it generally is. First wash the hands with a good toilet soap, using the hand brush thoroughly to clean out the pores and rout the germs, then, while the hands are still wet, put on a few drops of glycerine (perfumed, if preferred with some delicate perfume), and rub it thoroughly into the hands and wrists for a few minutes and dry on a towel. This will make the hands white, soft and smooth, and more sensitive to the sense of touch—for delicate work. The same treatment of the face after washing will keep the skin and lips free from chaps, even in rough weather. Pure glycerine has a strong affinity for water, and if used on the skin undiluted is an irritant.—*Dr. Frank Brandreth, Royersford, Pa.*

A Celluloid Saliva Tube for Individual Use.

By M. HENRI VILLAIRE.

MANY patients have a great dislike to saliva tubes which they know to have been previously used, in spite of the fact that they have since been sterilized. To overcome this difficulty I bring to your notice a tube which can only be used once. It is made of celluloid and the price is considerably less than one of glass or metal.

After its manufacture each tube is placed in an anti-septic solution for several hours, and then sealed in a transparent envelope. When it is about to be used the envelope is opened in the presence of the patient and used; when done with it is broken before the patient's eyes and thrown away.
—*L'Odontologie*.

Enlarged Tonsils and Oral Sepsis.

IN a plea for fewer operations on tonsils and adenoids in children, Mr. T. B. Layton, surgeon to the throat and ear department, Guy's Hospital, states that when the rule is made of having all carious teeth in children attended to before an operation on tonsils or adenoids is done, a very large number of these operations is avoided. This is so, he thinks, both in the cases seen after an acute attack and in those which come up with slight symptoms of snoring and deafness from adenoids associated with enlarged tonsils.—*The Dental Record*.

LOYAL.

SISTER Kittie's home from college with a host of modern kinks,
In the way of hygienics, sanitation, food and drinks.
Proteids and carbohydrates she combines exactly right,
For the strictly balanced ration she identifies at sight.
She knows all about digestion, what is best for us to eat :
What we need for body-building, growth and force, repair and heat :
And the dinner table's lovely when my sister has it set ;
But we haven't lost our confidence in mother's cooking yet.

—*Lippincott's*

Byron's Appreciation of His Dentist.

ACCORDING to the *Daily Chronicle*, the profession of dentistry stood higher in Byron's time than the profession of arms.

In September, 1820, on hearing that his favorite dentist had died, Byron wrote of John Murray: "The death of Waite is a shock to the teeth, as well as to the feelings, of all who knew him. I left him in the most robust health, and little thought of the national loss in so short a time. He was much superior to Wellington in rational greatness, as he who preserves the teeth is preferable to a warrior who gains a name by breaking heads and knocking out grinders. Who succeeds him? Where is tooth powder, mild and yet efficacious—where is tincture—where are clearing roots and brushes now to be obtained? I knew that Waite had married, but little thought that the other decease was so soon to overtake him."—*British Dental Journal*.

NO odds how well you do your task,
You'll hear the knocks of those who bask
In mediocrity.
No man e'er scaled the heights of fame
But fellows jealous of his game
With sneers and gibes were free.

When, with his mighty, Jovelike brush
Mike Angelo above the crush
In noble triumph rose,
He doubtless heard the knocks and whines
Of cheap john skates who painted signs
And barns and things like those.

The rabble couldn't rattle Mike ;
He turned out works of art the like
Of which men had not known ;
He heeded not the carpings jays,
But went on painting fifty ways,
And sculpting things in stone.

Do you the same, if you would win ;
Reply to knocking with a grin,
Or with a seemly jest ;
You'll make mistakes—all men do that—
But keep a cool head in your hat
And always do your best.

I used to weep and walk the floor
When some cold-blooded critic swore
That all my work was punk ;
But now I let the critics slide ;
My conscience tells me I have tried
To turn out decent junk.

—Walt Mason

Teeth and the Dangerous Trades.

By DR. HANAUER.

CHE part played by carious teeth in occupational diseases is no small one. In cases of lead poisoning the point of entry for the destructive agents is often a single carious tooth.

Workers in pits and mines where mercury ores are found, or in mercury distilleries, are perennially exposed to the danger of contracting severe and painful inflammations of the mucous membrane of the mouth, with the inevitably following difficulties in the assimilation of food. Only those with perfectly sound teeth should be allowed to enter trades where mercury is dealt with, and their teeth should be regularly examined so that any tendency to decay may be checked at the outset.

Copper is less dangerous than the above-mentioned metals, but will sometimes cause stomatitis. To chlorine the buccal cavity is particularly sensitive, and the workers in soda factories are especially prone to dental troubles owing to the action of muriatic acid. The minute particles of meal filling the air breathed by bakers and pastry cooks are most dangerous to the teeth. The percentage of decayed teeth amongst men, under forty years of age, employed in bakeries, is seventy-eight. The gastric and pulmonary diseases so commonly associated with these callings are undoubtedly favored in their inception by the presence of carious teeth and unhealthy gums.

Sulphuric, muriatic and nitric acids attack the front teeth to begin with; mercury and phosphorus the bones, gums and nerves.

Hat-making carries a wide margin of liability to mercurial poisoning.

The initial symptoms of profuse salivation and inflammation of the oral cavity lead to the trembling of the extremities and finally to paralysis. Leppe states that twenty out of thirty hat makers have diseased gums and teeth. Of eighty-one workmen examined, seventeen presented symptoms of mercury poisoning. Painters show a high percentage of carious teeth. Twenty-two members of the Strassburg Benefit Society, painters, made up between them, 1902-

1904, one hundred and sixty-five days of absence from work wholly on account of dental troubles.

The typical professional malady of glass blowers is a syphilitic affection of the mouth provoked by the common use by several workmen of one blow pipe. The peculiarity of the disease in these cases is that it flourishes for a long time unseen in the depths of the oral cavity, and a number of persons may be infected before its presence is discovered.

The prophylaxis and therapeutics of dentistry for the dangerous trades should include advice as to the choice of specialties for the mouth. Generally speaking pastes are to be preferred to powders for those whose mouths are daily in danger. Preparations packed in lead tubes should be rigorously excluded. Soft, not stiff, tooth brushes should be used. Mouth washes should be astringent rather than acid—*Abstracted from the Deutsche uahnärztliche ueitung.*

Dominion Dental Council Reports.

For Years 1912 and 1913.

REPORTED BY W. D. COWAN, D.D.S., SECRETARY-TREASURER.

SUMMARY of the minutes of the meeting of the Dominion Dental Council, held in Winnipeg, May 25, 1914.

Every representative of every agreeing Province in attendance. President Dr. Frank Woodbury in the chair.

The executive committee reported recommending several changes in the constitution. The first provided that any person wishing to take the class A. or B. examination may do so by taking one or more subjects each year, until his examination is complete. This was carried.

The second provided for a delay of one week in the date of holding the annual examination. Hitherto the examinations started on the first Tuesday in June. Hereafter they will start the second Tuesday in June. This is done because it is found impossible to properly arrange for the candidates in the time now allowed between the closing of the colleges and the first Tuesday. Hereafter all applications for examination accompanied by matriculation papers will have to be in the hands of the Secretary at least ten days prior to the second Tuesday in June.

The third constitutional amendment provides for the end of the council's fiscal year. The 31st day of July is the date fixed and the new officers take office on Sept. 1st. In the interval July 31st-Sept 1st, the books are to be audited and a full statement presented to the new officers. Another amendment adds a second Vice-President to the list of officers and executive committee. This is done so as to have the East, Centre and West represented on the executive, regardless of where the Secretary may be located.

It is also provided that hereafter no marks whatever are to be announced to an examination candidate. He has to be advised only that he has passed or failed.

Hereafter only colleges or schools located in agreeing Provinces will be recognized by the Dominion Dental Council.

Section 22 of the Constitution was amended so as to read:

PRELIMINARY REQUIREMENTS.

Section 22.—Matriculation examinations are not conducted by the Dominion Dental Council. For students commencing the study of dentistry after Jan. 1st, 1905, certificates representing the minimum standard of matriculation recognized by the Dominion Dental Council are as follows:

(a) Preliminary examination of, or matriculation into any institution in Great Britain or Canada recognized for the purpose of matriculation in medicine or dentistry by the General Medical Council of Great Britain.

(b) Matriculation into the Faculty of Arts of any Provincial University of Canada, or other approved university of equal standing.

(c) The following certificates granted by the Departments of Education of the agreeing Provinces, viz.: The second-class teacher, or other High School certificate of equal grade and including the required subjects.

(d) The matriculation or preliminary examination of any Dental Board or registering body in an agreeing Province which conforms to the standard set by the Dominion Dental Council.

All certificates named in this section must include Latin, and one of the following subjects or group of subjects: (1) French, (2) German, (3) Greek, (4) Physics and Chemistry.

Certificates enumerated in sub-section C must reach (1) an average of 60% with no subject below 40% or (2) a minimum mark of at least 50% in each subject.

Sub-section (d) must in all cases show an average of at least 50% in each subject.

Certificates will be recognized only after being accepted and endorsed by the registering body of an agreeing Province for the purposes of matriculation and registration.

Note.—Teachers and High School Certificates must be of the grade or class recognized for matriculation into recognized universities.

The re-reading of papers written by candidates who have failed has been discontinued.

The report of the Secretary showed that in 1912 fifty-four candidates wrote on 262 papers, failing in 11 of them. In 1913 sixty-four candidates wrote on 324 papers. Eighteen of them failed. In the past two years 13 class C. certificates had been issued. Three class C. applicants had been rejected. Forty class A. and B. certificates had been issued.

The Treasurer submitted the auditor's report as his report (copy attached).

The election of officers resulted as follows:

President—Dr. E. M. Doyle.

1st Vice-President—Dr. H. R. Abbot.

2nd Vice-President—Dr. J. S. Bagnall.

Secretary-Treasurer—Dr. W. D. Cowan.

Regina, Sask., May 22nd, 1914.

To the President and Members of the Dominion Dental Council of Canada:

Gentlemen,—We have audited the Books and Accounts of the Council for the period from 1st May, 1912, to 22nd May, 1914, and have to report upon the following matters:

(1) The statement does not include any revenue in connection with the forthcoming examinations.

A number of paid cheques, drawn on the old account at the Traders Bank of Canada, are missing, and should be obtained if possible. We have, however, seen receipts for all except the following:

Dr. Fasken	\$11.00
Dr. Saunders	10.25
Dr. Cullum	51.25

(3) The examination fees outstanding include a number of old accounts, several of which it may be necessary to write off eventually. We attach lists of the fees outstanding and of those paid in advance.

(4) We would recommend that an audit of the books be made as soon as the returns of each examination have been completed.

(5) No depreciation has been written off the value of books, stationery and office furniture.

(6) Receipts are missing for the following:

March 11th, 1913, Dr. Thompson, \$100.00 cheques seen.
 July 22nd, 1913, G. W. Harris, \$10.00 cheques seen.
 J. N. Doyle, \$10.00 cheques seen.
 J. M. Dixon, \$10.00 cheques seen.
 Dr. Dunbar, \$13.25 cheques seen.
 Dr. McLaren, \$100.00 cheque outstanding.

Respectfully submitted,

Sgd. Dawson & Rowan, C.A.

The Dominion Dental Council of Canada Revenue Account.

Expenditure.	Income.
To Examiner's Fees	\$ 960.35
Examination Expenses .	77.00
Salary—Sec.-Treas.	617.26
Printing, Engrossing and Stationery	263.75
Exchange	8.26
Postage and Telegrams..	59.60
Express	55.01
Office Expenses	17.85
Delegates Expenses	529.02
Guarantee Bond—proportion expired	20.00
Auditor's Fees	90.00
Legal Expenses	100.00
Surplus	1,181.90
	<hr/>
	\$3,980.00
	<hr/>
	\$3,980.00

The Dominion Dental Council of Canada.

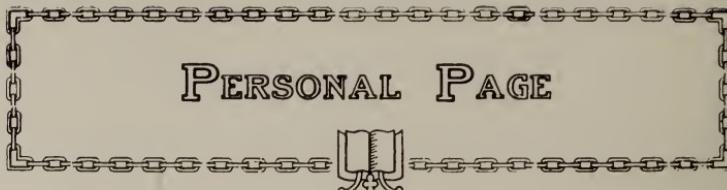
Statement of Cash Transactions from 1st May, 1912, to
22nd May, 1914.

Receipts.	Disbursements.
To Cash at Bank, 1st May, 1912	\$ 650.88
Registration and Exam- ination Fees	4,210.00
Balance owing to Sec.-Treasurer,	
Gen. Acct....\$.05	
Petty Ch Acct. 124.35	
124.40	
	By Petty Cash Balance due to Secretary at 1st May, 1912
	\$.24
	Examiner's Fees
	960.35
	Printing and Stationery.
	263.75
	Salary—Sec.-Treas., 1912 and 1913
	600.00
	Examination fees returned
	Exchange
	8.26
	Postage and Telegrams.
	59.60
	Express
	55.01
	Office Expenses
	17.85
	Guarantee Premium, 1913
	10.00
	Auditor's Fees to 30th April, 1912
	44.75
	Delegates Expenses
	529.02
	Examination Expenses ..
	77.00
	Regina Pharmacy
	10.75
	Legal Expenses
	100.00
	Cash at Bank 22nd May, 1914
	\$2,018.70
	Deduct, Out- stdg cheque 100.00
	1,918.70
\$4,985.28	\$4,985.28

Balance Sheet

As at 22nd May, 1914.

Assets.	Liabilities.
Cash at Bank	\$1,918.70
Estimated Valuation of Books, Stationery and Office Furniture	200.00
Examination Fees outstand- ing	315.00
	Examination Fees paid in advance
	\$ 120.00
	Sundry Creditors:
	Cowan, W. D.,
	Petty Cash \$ 124.40
	Cowan, W. D.,
	salary to date 213.70
	Dawson and Ro-
	wan
	90.00
	Guarantee Pre-
	mium owing....
	3.34
	431.44
	Surplus:
	As at 1st May, 1912
	\$ 700.36
	Add, Surplus for period to date 1,181.90
	1,882.26
\$2,433.70	\$2,433.70



PERSONAL PAGE

DR. W. C. WICKETT, North Bay, wrote *ORAL HEALTH* from Switzerland, where he is spending a few days on his trip through Europe.

Dr. Fred R. Mallory, the representative of the Canadian Dental Association, and Andrew J. McDonagh, the Government representative to the International Dental Congress, to be held this year in London, sailed on the 4th of July by the Megantic. Dr. Mallory will give to the readers of *ORAL HEALTH* an account of the I. D. C., the most elaborate dental meeting which has ever been convened.

Dr. F. C. Bush, Winnipeg, is also attending the Congress. He is a reperesentative of the Dental Society of Western Canada.

Dr. R. W. Hull, Toronto, and Dr. W. G. Thompson, Hamilton, are doing duty with the Army Medical Corps, attached as dental surgeons to the field hospital and Dr. E. A. Grant is to take charge of the Cadet Camp.

Capt. C. A. Corrigan, D.D.S., and Lieut. A. Dawson, D.D.S., are at the Niagara Camp with the Army Service Corps.

Drs. C. H. Clarkson and J. D. Bagshaw are touring the British Isles.

Dr. W. B. and Mrs. Amy are spending a vacation in England and the continent.

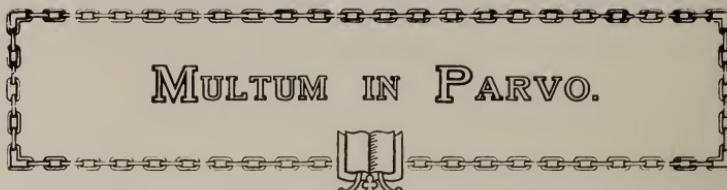
Dr. Geo. Gow has sailed for the British Isles where he will spend his vacation.

Drs. Wallace Seccombe and W. H. Doherty have moved to a new suite of offices in the Oddfellows Temple, 229 College St., Toronto.

Our congratulations to Dr. Morton A. McIntyre, who was married to Miss Myrtle Stonehouse Frost on June 24th at Forest, Ontario.

Dr. Cummer's Post-Graduate Course.

CHAT the great movement in educating the public to the necessity of oral sanitation is reacting upon the dental profession, and that the dental profession is responding with newer, better, and more sanitary dentistry is the unforgettable impression of the visitor at the great meeting of the National Dental Association at Rochester, N. Y., recently. Removable prosthetic pieces, not touching the gingival margins, locked mechanically in position, with small metal saddles and bars, instead of vulcanite covering the palate, have resulted in the discontinuance in the practices of dentists whose foresight has led them to an appreciation of the situation. Anatomical articulation, and modern impression making occupied an important position in the prosthetic section, being shown by clinics and moving picture film. All of these features and many others are included in the course to be given in the dental college building from August 31st to Sept. 14th, inclusive, and it is felt by those who have signified their intention of taking the course, and by the management, that this opportunity is timed just ahead of a demand on the part of the public that will force every dentist of assured position to the necessity for such knowledge and handcraft. The fee is as low as can possible be for the presentation of these subjects in an efficient way, being fifty dollars, of which ten dollars is necessary to secure a place, and the balance payable on August 31st. Dr. Wilson, of Cleveland, known over America as a prosthetic expert, reports progress in the material which he has in preparation, viz., plaster and vulcanite manipulation etc. About three-quarters of the class is filled with a happy combination of progressive and congenial men of the profession. From correspondence received an unexpected interest has been shown from various points in Canada and the United States. Correspondence may be addressed and booklet may be had by addressing W. E. Cummer, 2 Bloor St. East, Toronto.



MULTUM IN PARVO.



This Department is Edited by C. A. KENNEDY, D.D.S., 2 College St., Toronto
Librarian, Royal College of Dental Surgeons of Ontario

*Helpful Practical Suggestions for publication, sent in by members
of the Profession, will be greatly appreciated by this Department.*

PREVENTING THE BUCKLING OF GOLD PLATES.—To prevent the buckling of gold plates in swaging, a slit is cut at the median line, from the margin to the ridge, lapped over, and, when swaged, soldered. This should be done in all cases, as this is the weakest point, and the plate breaks there. By doing this, the weak point is doubled in strength.—*L. P. Haskell, Dental Review.*

RECEDING GUMS.—Apply glycerite of tannin (made by dissolving one ounce of tannic acid in four ounces of glycerine by gentle heat) to spongy or debilitated gums as a tonic astringent lotion. It condenses soft gums and re-establishes the nutritive functions.—*Dr. N. S. Hoff, of Ann Arbor, Mich.*

TINCTURE OF BENZOIN.—If from any cause the process has been exposed, pain can be instantly relieved by covering the exposure with a pellet of cotton saturated with tincture of benzoin. The application is also valuable in relieving painful eruptions of third molars.—*Dr. G. A. Kennedy, Paisley, Ont.*

CLEANING CEMENT SPATULA.—Allow the spatula to remain a few minutes in water and the half solidified cement is easily wiped off.

CLEANING THE CEMENT SLAB.—Dilute nitric acid will remove all cement particles, no matter how hard, and the slab after rinsing with water will have a clean, smooth surface.

To PREVENT PLASTER FROM ADHERING TO FLASK.—Wipe out the flask before using with a *soapy* cloth.

TO PREVENT PLASTER FROM ADHERING TO RUBBER IN VULCANITE WORK.—Coat the model with Silex just before packing and allow it to dry a few minutes.

TO REPLACE A BROKEN PLASTER TOOTH.—Simply use liquid celluloid, and you cannot break it in that place any more. Broken plaster casts you may mend in the same way.

LAYING UP TROUBLE.—Those who are recommending the use of a hot air blast to hasten the setting of silicate cements are inviting trouble. Did you ever notice a pavement of Portland cement being laid on a hot day? Unless it is sprinkled occasionally it checks and may even explode. Most dental cements are the same in principle. If they are carefully balanced, they must be kept free from both air and outside moisture while setting.

SILICATE CEMENTS—IMPERFECT MARGINS.—Complaint of this character almost invariably arises when directions are disregarded. While the cement is setting, often the operator keeps burnishing over the strip, thus interfering with normal crystallization. Notice the ice which forms on a pond on a cold, still night, and that which forms during a gale of wind.

HOW TO MIX PLASTER.—Try mixing plaster by simply sifting into sufficient water. When you think that you have enough plaster, pour off the excess water and use *without stirring*. This produces a mix absolutely without bubbles.

A HANDY MATRIX FOR MELOTTE'S METAL.—A piece of brass tubing one inch long, one inch in diameter, and $\frac{1}{4}$ inch thick on one edge and tapering on the inside to $\frac{1}{8}$ inch thick on the other edge, makes a very useful matrix for holding Melotte's metal dies. It is used exactly as the rubber ring that comes with a Melotte's outfit, only it is not removed from around the metal. By this method cracking a die is impossible.

MIXING SYNTHETIC CEMENT.—After a mix of synthetic has been obtained, of proper stiffness and consistency, gather it quickly in a ball on the slab and tap it gently several times with the agate spatula. This will develop a fine homogenous consistency.—*Arthur G. Smith, Dental Review.*

ORAL HEALTH.

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A Monthly Journal devoted to the furtherance of individual and community health by the advancement of Dental Science and Oral Hygiene.

Published in the hope that it may reach those with an open mind, a willing heart and a ready hand to serve.

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Vol. 4

TORONTO, AUGUST, 1914.

NO. 8

EDITORIAL.

Public Philanthropy and Dentistry.

HERE are abundant indications that dentistry has at last come into its own. Not only has the physician come to look upon the dentist as an indispensable ally in maintaining individual and public health, but the general public has changed its attitude toward the profession and dental treatment is now considered an absolute necessity—not a luxury as was formerly the case.

An awakened public interest in dentistry is shown by the sympathetic attitude of public bodies generally and the active philanthropy of private citizens. The great Forsyth Infirmary of Boston, founded by the Forsyth family is one of many indications of this.

The Times Weekly Edition of June 26th announces the gift of \$25,000 to St. Bartholomew's Hospital by Mr. Edwin Tate, of London, to be employed "to assist necessitous persons to obtain artificial teeth." Under the terms of the fund persons may be assisted to the extent of one-half of the cost of the work.

It is interesting to note that dental philanthropy in Can-

ada and United States has almost entirely been for children, with prevention as the dominating principle. This, we believe, to be the wiser plan to follow, and as a matter of fact the profession is driven to this plan by reason of the lack of sufficient dental operators to man free clinics for the adult poor.

Practise What You Preach.

SO much has been said and written in recent years urging dentists to assist in advancing oral hygiene that some may have failed to give adequate care and attention to their own teeth, while at the same time urging the importance of oral hygiene upon others.

To what effect is an oral hygiene appeal made to a patient if the dentist's own teeth show need of prophylaxis? Unfortunately this need is found to exist among many otherwise progressive members of the profession. Clinicians illustrating the technique of prophylaxis at dental conventions, never fail to find ample clinical material among the dentists themselves. This shows a carelessness that certainly should not exist.

Preach oral hygiene by all means, but at the same time let us not fail in its practise.

Toronto Dental Society Annual Picnic.

CHE annual picnic of the Toronto Dental Society was held on Tuesday afternoon, June 23rd at Long Branch, and proved a most enjoyable event. The only regret of those present was that more of the members of the society did not take advantage of the occasion to share the good time.

The first event of the afternoon was a game of indoor baseball, the teams being chosen by the President and Vice-President. Drs. Bob Henderson and Baird relieved each other umpiring the game.

Following a four innings game of ball came a programme of some seven or eight events of games for the ladies and gentlemen. The following received prizes: Mrs. J. B. Willmott, Mrs. Paul, Mrs. Husband, Miss Chisholm, Miss Arnold, Drs. Arnold, Kennedy, Van Duzer, Black and Ward.

Dr. J. B. Willmott distributed the prizes after dinner, which was served at the Long Branch Hotel.

Among those present were: Mrs. Grieve, Miss Switzer, Mrs. Hendrick, Mrs. Henderson, Miss Bothwell, Mrs. Baird, **Mrs. Van Duzer**, Mrs. Black, Drs. Grieve, Kennedy, Risdon, Husband, Bothwell, Seccombe, Semple, Rhind, W. E. Willmott and Mr. W. G. Hendrick.

Oral Hygiene Reports.

Buffalo, N.Y.

Oral Hygiene was discussed at considerable length at a meeting of the 8th District Dental Society a short time ago, which was attended by two hundred people, at the Hotel Statler. The urgent need of a free dental dispensary was emphasized by dentists, physicians, agitators and laymen. All were agreed that such an institution was necessary to assist in the moral, physical and intellectual development of the children of Buffalo.

Edward H. Butler offered to give \$100 toward the establishment of an institution, that the movement for aiding Buffalo poor children might get promptly under way.

Oklahoma City.

The Women's Federated Clubs of Oklahoma have arranged a series of lectures on Oral Hygiene, to be held at the High School auditorium, to which the general public has been invited. The object is to stimulate the campaign for improved dental conditions among school children, which was started in Oklahoma more than a year ago. The opening lecture will be given by Dr. Thomas P. Hinman, of Atlanta, upon the subject "Oral Infections and the Relation to Systemic Disorders."

Cleveland, Ohio.

An announcement was made at a meeting of the Cleveland Auxiliary of the National Mouth Hygiene Association that application was made by Lakeside Hospital to hold a series of lectures to nurses on Oral Hygiene. Huron Road Hospital nurses will also attend the lectures, which will be given three evenings a week for one month.

TRUTH.

—
Truth is as impossible to be soiled
by any outward touch as
the sunbeam.

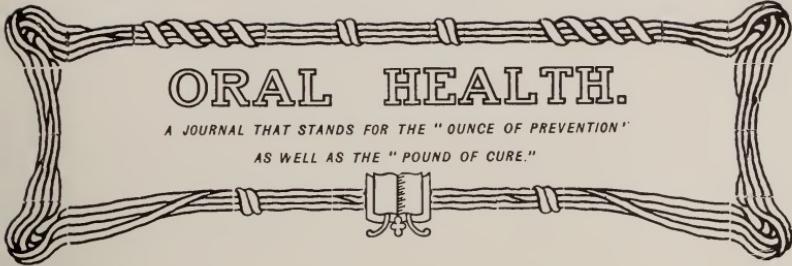
—*Milton*



F. W. Barbour, D.D.S.

FREDERICKTON, N.B.

PRESIDENT CANADIAN DENTAL ASSOCIATION



ORAL HEALTH.

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION"
AS WELL AS THE "POUND OF CURE."

VOL. 4.

TORONTO, SEPTEMBER, 1914

No. 9

Efficiency.

Suggestions Regarding Offices, Assistants, and Business System.

F. W. BARBOUR, D.D.S., FREDERICTON, N.B.

CHE bringing to pass of the highest possible results is what counts in the industrial life of the present day. The power to produce such results exhibits efficiency. Concentration of mind and energy has been brought to bear in these latter years, to develop the most effective means to make effort co-ordinate, in order to bring success. Men who have made a study of what could reasonably be called a science have become prominent in business endeavor and demand and earn high salaries.

The bringing into effect of their findings means the achievement of the highest possibilities in the line of production. It is the bringing to pass of methods, machinery and ability that will accomplish the most with the greatest economy of effort and material.

This is brought about by improvement in the worker, apparatus and material; and by the elimination of waste time and effort. Modern manufacturing establishments have achieved amazing results by the installation of efficiency methods.

It has been abundantly proven that it is false economy to continue the use of obsolete machines or those that are defective. The scrap-heap absorbs to-day appliances, the discarding of which a few years ago would have been regarded as appalling waste. Now it is known that the in-

creased earnings of up-to-date apparatus quickly exceeds the amount lost in discarding the old outfit.

It is a treat and an inspiration to visit and study the methods adopted in connection with a modern industry. The way in which every movement of the employees and the systematic processes in use are made to bring about desired ends is nothing short of marvellous. Modern conditions of competition and the great demand there is for the production of an article at the lowest possible cost demands such an organization.

Employees have to be prepared to fit into the groove that is laid out for them, in order to make the whole work of the establishment co-ordinate. The failure of one unit to work in unison with the rest disorganizes the whole and prevents the realization of the best results.

The scrap heap absorbs men often as well as appliances and modern conditions require that an acute mind and a capable hand has to be possessed, in order to keep up with those who lead.

The nature of the practice of dentistry with its human clientele makes it impossible to adopt in its entirety the principles which bring about efficiency. A knowledge of these methods, however, will be found to be of value, more or less, to all practitioners. The very fact that all laid down ideas cannot be followed only emphasizes the necessity of attending most conscientiously to those that are possible of adoption.

Those offices which employ a number of workers and where the various phases of the work can be divided up systematically have in a number of cases shown a great degree of the capacity that has been referred to. The ordinary practice is carried on however by one, or it may be two professional men, with some assistance, and the work is so diversified and irregular that its being systematically carried on is not wholly practicable. In spite of this, there is no doubt but that there are lessons to be learned from the study of efficiency methods, that will improve the dentist's working capacity and render him better able to accomplish speedy and adequate service. This may be brought about by a careful study of the conditions under which the practice is carried on and a comprehensive outlook on the desired good that may be accomplished through the effort put forth.

The most sure and practically the only satisfactory way

in which the greatest good may be accomplished is not by any special effort along one particular line, but is the accumulation of ability and conditions that are acquired from the beginning of the educational career and straight through the whole of professional life.

Training (both as derived from preliminary study and that of the dental course), personal health and ability, equipment, business system, office help and the rooms occupied all have their share toward bringing to pass the most desirable results. It would be impossible in one paper to deal in any way adequately with these different phases of the subject of efficiency in our profession. The effort will be made to touch upon a few subjects in as helpful a way as possible. Consideration will be given to the offices occupied, the personal assistance which may be extended by the young lady in attendance and the system of records and accounts that have been found adaptable. It is by no means suggested that all of the ideas expressed are original or that the last word shall be said in connection with these matters. As the writer never fails to acquire helpful knowledge through some form of contact with his fellows, it is hoped that something in the following will be found of value to some who may be patient enough to absorb it.

The study on the part of the dentist of the conditions under which he works and the examination to ascertain whether improvements would not be of advantage will find few that cannot see some avenues of advancement.

The average practice in the average city takes care of regular patients and also a large number who attend only occasionally—and there is a considerable class that are seen but once. All kinds of work have to be attended to, including a good deal without appointment; as this may have to be done along with considerable other work, two or more operating chairs are required. These suggestions are given with such a practice in mind, though it is quite possible that some ideas are adaptable to offices that may have a rather different clientele.

The arrangements adopted and endeavored to be explained below are the result of nearly a quarter of a century of thought and experience. There has been a gradual development through more or less satisfactory (mostly less) conditions. Changing ideals bring changing ideas and what was well enough at one time becomes later unsuitable; and what was looked upon as unnecessary or as a luxury, now be-

come altogether desirable and indispensable.

The personal contact with men of advanced ideas and methods stirs within an ambition to accomplish better things. The knowledge that there are better conditions existing than those under which one operates leads to dissatisfaction, and discontent is often the parent of improvement. The dentist who fails to take the opportunity to come into contact with those of ability as offered through the various gatherings is not living up to his possibilities and misses chances to gain valuable information.

In taking up the subject of plans for an office, it is of course realized that all buildings do not allow of the same number or size of rooms, and the plans that are submitted, while quite likely not readily accomplished, may in some degree be copied helpfully. A mistake is often made by continuing in a building that does not give opportunity to develop in the right direction, the idea sometimes being that the change in location may have a lessening effect on the amount of practice. It has been proven conclusively that a change to adequate quarters will quickly draw as large a number of professional visitors and usually of a better class. Further, the comfort enjoyed and the increased respect that will be extended by the public and by fellow practitioners will mean a lot.

Dissatisfaction may exist in the minds of some with their present facilities, as was the case for a long time with the writer. If a change is contemplated, or if present consideration should lead to dissatisfaction, any assistance toward a satisfactory change should be acceptable.

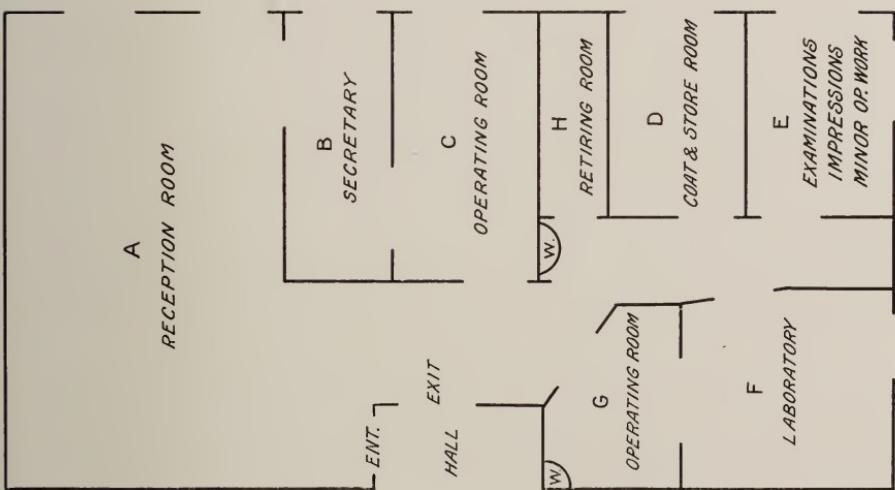
The way that comes most naturally to the writer, in order to present his ideas is by plans showing his rooms and giving a description of the conveniences that he has found desirable. In this particular case there was the good fortune to occupy a corner of a building, thus securing light from seven windows on two sides and making it possible to have a direct light into nearly all the rooms.

It was not felt necessary to draw the plans shown exactly to scale, but a sufficient evidence is given of the size and relation to one another to depict any value that may be borne by them. Attention is called to the fact that there is an exit as well as an entrance to the rooms, the former being from a hallway leading to the various operating rooms, which ren-

ders unnecessary the appearance of a patient in the reception room (A) after a sitting.

The reception room is not intimately related to the entrance to an operating room, and two doors may be closed between operating rooms, to reduce objectionable noises to a minimum.

Room (B) is mainly for the use of the assitant for secretarial work; it is also useful for such consultations as do not necessitate an operating chair.



An arrangement of mirrors makes it possible for the young lady to recognize callers at the entrance and judge whether they should have immediate attention.

Room (B) is directly connected with the main operating room, though it will be noted that the regular entrance to the latter is from the hallway.

A reference to some of the out of the ordinary accessories of the operating room (C) may be of value. One of the cabinets is of local manufacture from designs which it was believed would make it more serviceable than the standard makes. It is only seven inches deep, making the contents of

the drawers readily obtainable, and at the same time occupying the least possible room. Its size otherwise is four by four feet, and it contains a large number of drawers of varying sizes. These drawers are so used that all of the instruments and material for the various kinds of work are, so far as possible, kept in the same drawer, for instance, one contains rubber dam, cottonoid, cheek and chin pads, shears, punch, dam holder clamps, clamp forceps, ligatures and weights. Similar combinations can be readily imagined.

The portable table tops, now so largely adopted, are strongly recommended, both as time savers and additional evidence of aseptic excellence—the use of paper head rest pads serve the same purpose. A pad of a dozen or more is attached by a narrow white tape, and one is easily removed, just as the patient is being seated in the chair. The high grade white paper table napkins, cut into four, make about the size that is usually needed. A very satisfactory material for chair covers, aprons for patient and operator, and holders for enclosing instruments, is the fine white silk preparations, such as aseptole, which is impervious to moisture or acids, is very easily cleansed and has no odor. It protects the clothing much more effectively than towels and may save much time and money which might otherwise be lost through injury to wearing apparel.

The ordinary high ticker baskets used by brokers make excellent waste receptacles. Line these with zinc and they are almost imperishable. They are so deep that the contents are rarely visible to the patient, and they are very easy of access to the dentist.

Near the entrance to the operating room, and in fact within two steps of the doorway into all of them, is the operator's toilet basin. This is so placed that in passage from one patient to another cleanliness can be attained most readily. Foot control operates the water supply, the value of which is obvious. The sterilizer is easily in evidence and is serviceable to any room. Any one intending to make a change in his sterilizing outfit would do well to examine into the rapid heating value of the Hot-point electric stoves. With suitable instrument receptacles they prove splendidly effective.

An automatically lighted coat and store room is shown in (D). This contains hat hooks, compressed air unit, the cleaning outfit, surplus supplies, magazines, and in fact, any-

thing for only occasional use and which may be undesirable to the view.

Room (E) is for examinations and impressions and for minor operative work when (C) is in use. It may later be fitted up with identical cabinet and identically placed instruments, so that it may be used alternately with (C), so as to economize still further time in the transfer of patients. The laboratory has been placed in what is about the most desirable position, being in the corner and having two windows. This has been deemed advisable because perfect light is so often essential and because it is the one room where two or even three are often at work.

To any who, like the writer, are deprived of illuminating gas for laboratory work, it will give a wonderful improvement in the working capacity if the compressed air gasoline system is installed, if such is not already in use.

Between the laboratory (F) and the third operating room (G) is placed the artificial tooth cabinet, making it assessible to any room.

(G) is designed particularly for an anaesthetic room, though it may be used by associate for operating. It is directly connected with the dressing room (H), the rubber wheeled couch being easily rolled from one room to another, thus relieving the chair quickly for further use if needed.

The dressing room is for the use of lady patients, preceding and following a sitting, and is particularly appreciated in connection with analgesia or anaesthesia. In it is a wash basin, dressing mirror and table, with the usual toilet requisites.

All these rooms are sufficiently large for comfort and accessibility of instruments, but not so large as to invite undesired onlookers.

The question may arise in the minds of some as to whether such rooms are worth the cost, and as to how the expense is to be provided for. Of course it would be acceptable if the landlord would undertake such work, and this may reasonably be expected if additonal rental is paid to reimburse him for his outlay. But if this scheme cannot be carried out, the assuming of the cost by the dentist himself is fully warranted. Such a work should be regarded as a permanent improvement and the expense charged to capital account. By figuring interest and depreciation, the real annual cost can be arrived at. Supposing \$500 would be re-

quired to properly bring about the changes, and 15 per cent. the amount set aside for depreciation, then this \$75, with \$35 for interest, would make an annual charge of but slightly more than two dollars per week, or about four cents a working hour. A continuation of such a charge would permit a similar total expenditure about every seven years. Such radical changes would occur very seldom, but a certain amount of renewing should be done every year, and it might be that the full \$500 would be judiciously expended, at various times during the above period, and results secured that would entirely compensate.

Reverting in a general way to offices and their adaptability, the writer claims that the appearance of such are most acceptable to the layman, at least, when all is done that is possible to eliminate those things that are suggestive of surgery or causes of pain.

A reception room can be bright and comfortable and pleasing to the eye, but not elaborately furnished as to lessen the sense of ease.

Operating rooms must necessarily have objects visible that probably are unpleasant to some people, but these should be reduced to a minimum, and especially at the beginning of a sitting, hidden where possible or at least kept in inconspicuous places.

The bracket type electric engine can be swung into a cabinet, and such a suggestion sounds practicable.

The sight of an elaborate switch-board may be of some advertising advantage, but if they were so made as to be enclosed when not in use, the influence would really be better. The ordinary patients are much more impressed when it is evident that their interests and comfort are sincerely in the mind of the dentist than by fixtures and furniture that carry with their sight possibilities of discomfort.

Efficiency is not increased in spending time in counteracting nervous conditions brought about unnecessarily.

A bracket table without drawers and having as its original content a few inoffensive articles, such as the cotton holder and the waste receptacle, is much more agreeable than the sight of a row of nickle instruments, no matter how artistically arranged. White enamel furniture does not appeal to the writer, nor does the surgical table with its display, as is sometimes exhibited.

Changing here to a consideration of the second division

into which this paper has been divided, a few words may be said on the value of a young lady assistant. This subject has been dealt with quite often lately, but it may that something has yet been left unsaid.

With proper co-operation the operator is permitted to concentrate on the distinctly professional work, at the same time feeling assured that his clientele are being satisfactorily attended to. Proper and kindly reception through the assistant prepares a patient mentally and means considerable in time saved in settling down to actual work. The importance of using the attendant as a buffer between the dentist and those whom it is not necessary to see himself, and to head off uncalled for telephone conversations, is most fully appreciated by those who have been compelled to attend to such matters themselves. It is an art to get the caller speedily and entirely ready for the dentist's services in the chair, and sometimes even more so to take charge afterwards and listen graciously to the histories of former dental visits of self or family. An appreciation of the value of the dentist's time should be early inculcated. Too great a tendency to conversation is an embarrassment to the most effective work.

The placing of an annunciator in the private office and an arrangement of suitable signals works out favorably. A portable telephone can be carried to the chair when necessary to be used.

The young lady can make out the cheques, do the banking, order supplies, assist in collections and attend to and anticipate her employer's needs when called to the chair.

Some have advocated instructing assistants in the preparation of cements and alloys. It is very questionable whether the final loss through the lesser quality attained and consequent ineffectiveness of product does not more than make up for the time saved in the mixes. It is also doubtful if time can be spent fairly by this attendant in laboratory work. Strict and careful attention to the needs expressed above would leave little time for other work in the office of a busy practitioner.

Proceeding to an exhibit of the printed matter that has been useful, further information will be incidentally given of the ways the young lady attendant can be of service.

The information card shown is for use when receiving a caller, whose desires are not known and where a message is

to be conveyed to the operator. Often the first line only is necessary to indicate all that is needed, while it may be that quite an amount must be written to save the necessity of a personal talk. Private matters can often be dealt with in

INFORMATION CARD

Object
 Name
 Address
 Time required
 Remarks:

this way, without being brought to the attention of the patient in the chair. It is quite possible that the assistant can arrange appointments, though examinations preceding same are preferable.

It often happens that in arranging work, it is important to have a number of successive sittings at definite intervals. This might not be possible, unless all were arranged at once. For such cases the "Appointment Guide" and the multiple "Appointment Card" have been devised. The dentist takes

APPOINTMENT GUIDE

M
 Number of Visits
 Duration
 Remarks :

APPOINTMENT CARD.

has appointments with Dr. Barbour for		
Day	Date	Hour
.....
.....
.....

If appointment must be broken sufficient notice should be given so that other arrangements can be made to fill the time allotted, otherwise a charge will be made.

only the time necessary to indicate on the former the number of visits needed, the time required for each, and in the space for remarks is stated the intervals between and pos-

sibly the time of day preferred. This is carried by the patient to assistant, who arranges mutually agreeable hours, considering existing appointments, and using the card above referred to.

The ordinary examination slips are used and as the various requirements are attended to these are checked off. Dr. Gow, of Toronto, colors the parts worked upon, as shown on the drawing, with different shades to designate the kind of material used. Such an idea carried out on these examination slips, with dates inserted, would afford a satisfactory record if properly filed away.

The method of bookkeeping has been adopted to suit the needs of this particular office and may be found applicable in some degree to most practices, especially where a large number are attended to, rather than a limited number who are worked for regularly and frequently. In the present case, very many are attended only for one series of sittings, being only temporarily in the city in the capacity of students, legislators, tourists, etc. A means of record has therefore been devised that will eliminate the necessity of storing a limitless number of cards, it may be with but one or two inserts.

It is so arranged that only those who do not pay for work on the day it is performed have to have their names carried forward to the ledger cards. At the same time, a complete record is kept of the work accomplished, which is readily referred to later, if necessary.

For original entry, properly ruled sheets are used, both sides being made available. These are about ten by fourteen inches in size and ruled for about forty entries on each page. Columns are arranged in suitable widths to show date, name of patient, person who is responsible for account if unpaid, nature and location of fillings, the same of inlays,

SYMBOLS

Gold—G.
Amal.—A.
Gutta-Percha—G.P.
Aschers Enamel —En,
Cement—C.
Nitrous-Qxide—N.O.
Ars-Dentalizing—Ars

DENTAL RECORD—F. W. BARBOUR, D.D.S.

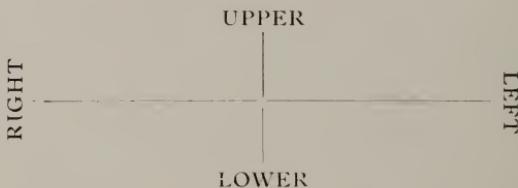
Beginning

OPERATIVE ACCOUNT

**EXPENSE
ACCOUNT**

(The above is printed on a heavy sheet 12 ins. wide and 10 ins. deep)

crowns, bridges, and so on for the various kinds of work, ending up with a column for the charge made and one for any cash received. Insertion is made in the regular place for cash paid on account of previous work, thus making it so that the proper filling in of the original entries on this sheet is all that is necessary on the part of the operator, everything else being performed by the young lady in her capacity as bookkeeper. Symbols such as *A* for Amalgam and *G* for Gold, indicate when set down in the proper column the material used or the specific work accomplished. The following diagram indicates the tooth and location that is worked upon :



The drawing depicted above represents the right and left sides of the upper and lower jaws. A number indicates the location of the tooth (numbered 1 to 8 beginning with central and extending to third molar), for instance $\frac{1}{3}$ would show a left upper cuspid. To show the surface, a dot above, below or on either side indicates. $\frac{1}{+}$ shows distal, $\frac{-1}{+}$ buccal, $\frac{6}{+}$ occlusal, etc., and if two or more surfaces are included the numbers are correspondingly connected.

Each of the pages is numbered consecutively, regardless of the year or month.

At the bottom of each sheet the cash columns are totaled and carried forward, until the end of the month is reached. The end of the month closes the sheet and the beginning starts a new one. Monthly totals are carried forward until the end of the year. At the end of each month a statement is easily prepared, showing the amount of work accomplished, the cash received, the cash expense and the net receipts both for the month and for the year to date. Being all filed under one cover, comparison with previous years is readily made.

It is possible to total up and carry forward the various columns relating to the work and so have knowledge of any particular phase that is desired. Each operator uses his

own sheet, so that different workmanship is easily located. An index is kept and enclosed under the same cover as the sheets, the name of each patient being inserted and the number of a sheet added as often as work is done. This system of record is believed to have an advantage over the usual diagrams of teeth, showing the cavities attended to, because duplication of work in certain teeth or the change of material or mode of procedure on same is apt to lead to confusion, after a series of years. Moreover, many times, space for such is more readily afforded in the system recommended here, as there is sufficient space in the unused part of the paper, following or preceding the insert showing the usual entry. This applies to pulp treatments or to peculiarities in physical condition, or to several materials being used in bridge work.

In the case of patients who do not pay for work as it is done, an additional record is necessary. In this case, alphabetically arranged cards are used, with regulation retainer. These cards are prepared differently and are made out only to the person that is responsible for payment of the account. All the members of a certain family will appear on the same card. Cards are kept in service in the usual way, just as long as they do not balance, and after being finished they are filed away in a similar retainer, until called for because of a further visit. This card bears space for the date, the name of the patient, the original entry sheet number, and if desired a copy of the design showing the actual work done. There is also a column for charge made and one for any payments. Finally, there is space showing when the account was rendered and special means of collection that may have been resorted to. A better idea of the method of use may be given by an examination of the drawing below:

M.....

In Account with F. W. BARBOUR, D.D.S

Date	Patient	Card	Amount	Cash	Rendered

These methods of record have been in use for nearly five years, and have proved far more satisfactory than those

used for the previous fifteen.

A little time on the part of the assistant each day will keep the records so up to date that any account can be referred to at a moment's notice, and she can look the history of any previous work readily.

In the foregoing, an effort has been made to give assistance to those who are anxious to increase effectiveness, and if such shall be accomplished, even in a small way, the writer will be satisfied.

The Fate of Cocain in the Body.

SOME of the prevailing conclusions in regard to the behavior of cocaine appear to be in need of amendment in the light of up-to-date information. When it was first reported that subcutaneous administration of this alkaloid was not followed by its reappearance in the urine, this find, taken in connection with some observations of a different type, made it seem plausible to assume that cocaine may be destroyed in large measure by contact with animal tissues. As a matter of fact, newer experiments conducted in the Pharmacologic Institute of the University of Berlin bring evidence that cocaine may actually be excreted in decidedly large proportions by the kidneys. At first, in any period of frequent administration of the alkaloid, a tendency toward cumulative manifestations may arise, but the proportionate daily output increases with the use of the drug. According to these newest studies of Rifatwachdani, even prolonged contact with living tissue does not appear to induce a destruction of cocaine. For the closely related derivative egonin, the kidneys have likewise been demonstrated to afford an effective path of excretion.—*Editorial, Journ. of Amer. Med. Association.*

The Reaction of the Saliva.

By EDWARD C. KIRK, D.D.S., ScD.

In Collaboration With

W. S. CROWELL, B.S., CH.E., AND J. L. APPLETON, JR., B.S.

EVER since dental caries, dental erosion, and other disorders destructive of tooth structure have been the subject of more or less serious consideration and study, the probability that acids were somehow concerned in these processes has been generally recognized. Indeed, the indictment against acid substances as the principal agents concerned in these processes has been definitely confirmed by modern scientific research. Moreover, the character and origins of certain of the acids which exert a destructive action upon tooth structure has been clearly demonstrated, certainly in the case of dental caries, and I believe with almost equal certainty in the case of so-called chemical erosion of the teeth. The fact that these disorders were suspected to be of acid origin is a logical deduction from the fact that tooth structure undergoes disintegration by, and is soluble in a variety of acids; also that it is insoluble in alkalis, and does not undergo disintegration by any strength of alkali that can be tolerated by the buccal mucosa.

With these data, constituting as they do common knowledge in dentistry, it naturally followed that search should be made for the factors which might be regarded as protective against destruction of the teeth by acids. Attention naturally concentrated itself upon the reaction of the saliva as a means for detecting the presence or absence of acid agencies and investigation of its alkaline content as an index of its freedom from acid agencies, and therefore of its protective potency with respect to the destructive effect of acids upon the tooth structure.

That acids and alkalis ordinarily neutralize each other to form innocuous saline compounds; also that certain substances called indicators, the most commonly known of which is litmus, under color changes when brought into contact with acid and alkaline substances, respectively, is likewise common knowledge. Hence, it has been the usual prac-

Read before the First District Dental Society of the State of New York, March 2, 1914.

tie to test the reaction of the saliva in suspected cases by means of litmus paper, and to attempt to determine by the effect of the saliva upon the color of the litmus so treated, the acidity, alkalinity, or neutrality of the saliva thus tested. Various experiences with the litmus test quickly brought forth the fact that as an indicator for precise work it was faulty, hence other substances of the indicator class were brought into requisition in order to determine the reaction of the saliva with greater precision, but as in the case of litmus, a certain factor of error was found to be inherent in the use of all indicators where precise results were sought.

Among the peculiarities of the salivary reaction that were made evident from the use of litmus as an indicator, is the so-called amphoteric reaction noted in many salivas, that is to say, it was found that some salivas would cause blue litmus to turn red, and the same saliva would cause red litmus to turn blue, from which the conclusion has been deduced that in a saliva yielding the amphoteric reaction there existed at the same time free hydrogen ions and also free basic ions. Or otherwise stated, the saliva contained two substances of acid and basic properties respectively not capable of neutralizing each other, which confronts us with the deduction that the basicity or alkalinity of the saliva, to some degree at least, is dependent upon the presence of a substance or combination which renders it incapable of neutralizing the source of acidity with which it is associated.

The study of the reaction of the saliva, as determined by a variety of indicators, shows a large factor of error in connection with those tested—namely, litmus, methyl orange, congo red, phenolphthalein, and thymolphthalein, as shown by the accompanying table:

TABLE A.
RESEARCH ON SALIVA INDICATORS.

Procedure.

To show the unreliability of indicators in titrating weak acids and bases such as are present in saliva, some titrations were made of phosphoric acid with sodium hydroxide, using the following indicators:

Methyl Orange, Congo Red, Litmus, Phenolphthalein and Thymolphthalein.

Note 1.—Phosphoric acid was selected because of its undoubted occurrence as the various sodium salts in saliva. Its presence in saliva was absolutely proven by the following experiment: 5 gram samples of two salivas were digested

with concentrated HNO_3 and baked until all organic matter was carbonized or destroyed. The residues were dissolved, filtered and the P_2O_5 determined in the filtrate.

Subject A, caries susceptible P_2O_5 0.022%
 " B, " immune " 0.028%

Saliva collected by expectoration while chewing paraffin wax about three hours after breakfast.

Experimental Part.

(a) Standardization of H_3PO_4 . Solution.

10 cc. solution yield .3892 gm. $\text{Mg}_2\text{P}_2\text{O}_7$	equals 0.2482 gm. P_2O_5
10 cc. solution yield .3888 gm. $\text{Mg}_2\text{P}_2\text{O}_7$	equals 0.2479 " "

Average	0.2481 " "
10 cc. N. H_3PO_4 should yield .2481	0.2367 " "

Normality equals — equals 1.0481
 .2367

9.541 cc. H_3PO_4 solution equals 10 cc. N. H_3PO_4 solution.

(b) Standardization of NaOH solution.

10 cc. H_2SO_4 solution yield 0.1331 gm. BaSO_4	
10 cc. H_2SO_4 solution yield 0.1336 gm. BaSO_4	

Average	0.1334 gm. BaSO_4
10 cc. N/10 H_2SO_4 contains H_2SO_4 equals .1144 Normal.	equals 0.05605 gm. H_2SO_4

10 cc. NaOH equals 8.80 cc. H_2SO_4 solution.
NaOH equals .1007 Normal.

N/10 and N/100 H_3PO_4 were made up by properly diluting the above standard H_3PO_4 solution.

N/100 NaOH was made up by properly diluting the above standard NaOH solution.

(c) Titration.

(1) *Theoretical results.*

Case I.

10 cc. of NaOH solution would chemically neutralize 10 cc. of an equivalent H_3PO_4 solution if all three of the (H^+) ions were active, i.e., H_3PO_4 (H_3) $^{+++}$ (PO_4)—
Case II.

10 cc. of NaOH solution would neutralize chemically 15 cc. of an equivalent H_3PO_4 solution if two of the (H^+) ions were active, i.e., H_3PO_4 (H_2) $^{++}$ (HPO_4)

Case III.

10 cc. of NaOH solution would chemically neutralize 30 cc. of an equivalent H_3PO_4 solution if one of the (H^+) ions were active, i.e., $H_3PO_4 - (H)^+ (H_2PO_4^-)$

Hence, in order for our titrations to be of any quantitative value our results should be 10 cc. N/10 NaOH is equivalent to either 10 cc., 15 cc. or 30 cc. N/10 H_3PO_4 .

(2) *Actual titrations with various indicators.*(a) *Litmus.*

(1) 10 cc. N/100 NaOH equals 19.72 cc. N/100 H_3PO_4

(2) 10 cc. N/10 NaOH equals 165.35 cc. N/100 H_3PO_4
equals 16.54 cc. N/10 H_3PO_4

(3) 100 cc. N/100 NaOH equals 10 cc. N/10 NaOH
equals 21.6 cc. N/10 H_3PO_4

End points in every case obtained after boiling off CO_2 and found to be very unsatisfactory.

(b) *Methyl Orange.*

10 cc. N/100 NaOH equals 31.06 cc. N/100 H_3PO_4

10 cc. N/10 NaOH equals 359.0 cc. N/100 H_3PO_4
equals 35.9 cc. N/10 H_3PO_4

100 cc. N/100 NaOH equals 30.72 cc. N/10 H_3PO_4

Solutions not boiled, since Methyl Orange is not sensitive to CO_2 ; end point very difficult to satisfactorily determine.

(c) *Congo Red.*

10 cc. N/100 NaOH equals 30.92 cc. N/100 H_3PO_4

10 cc. N/10 NaOH equals 344 cc. N/100 H_3PO_4
equals 34.4 cc. N/10 H_3PO_4

100 cc. N/100 NaOH equals 10 cc. N/10 NaOH equals
30.20 cc. N/10 H_3PO_4

Solution not boiled (see above)—end point fairly positive.

(d) *Phenolphthalein.*

10 cc. N/100 NaOH equals 17.34 cc. N/100 H_3PO_4

10 cc. N/10 NaOH equals 181.0 cc. N/100 H_3PO_4
equals 18.10 cc. N/10 H_3PO_4

100 cc. N/100 NaOH equals 10 cc. N/10 NaOH equals
15.80 cc. N/10 H_3PO_4

End point after boiling off CO_2 very sharp and satisfactory.

(e) *Thymolphthalein.*

10 cc. N/100 NaOH equals 11.92 cc. N/100 H_3PO_4

10 cc. N/10 NaOH equals 151.8 cc. N/100 H_3PO_4
equals 15.18 cc. N/10 H_3PO_4

100 cc. N/100 NaOH equals 10 cc. N/10 NaOH equals
13.00 cc. N/10 H_3PO_4

End point as above.

(d) *Conclusions.*

From a consideration of the above it will be seen that in no case is a sharp, consistent end point reached which is not affected by the concentration of the reacting solutions. With no indicator are the theoretical results obtained. Methyl Orange and Congo Red approach Case III. Litmus lies between Cases II and III, while Phenolphthalein and Thymolphthalein lie between Cases II and I.

It is evident that any determination of the acidity or alkalinity of a substance consisting largely of phosphates and complex amino acid combinations, even weaker in positive acidity than phosphoric acid, in which indicators are employed, can never be absolute, and that results so obtained cannot even be considered comparative unless an absolute uniformity of conditions is rigidly observed.

The basic ions upon which the alkalinity of the saliva depends are presumably derived from the inorganic salts which it contains. It has not, so far as I am aware, been determined by any investigator that the saliva ever contains a free alkali. Both chemical and micro-chemical analysis have, however, demonstrated that the principal and characteristic basic salts of the saliva are sodium phosphate and calcium phosphate, with a marked preponderance of the former over the latter. Furthermore, analysis has shown that the total inorganic solids of the saliva amount only to approximately 0.4 to 0.6 (Starling).

In order to determine the presence and amount of these phosphates in the saliva five gram samples of two salivas were digested with concentrated HNO_3 , and baked until all organic matter was carbonized or destroyed. The residues were dissolved, filtered, and the P_2O_5 determined in the filtrate:

Subject A, Caries Susceptible, $P_2O_5 = 0.022\%$

Subject B, Caries Immune, $P_2O_5 = 0.028\%$

The saliva was collected by expectoration while chewing paraffin wax about three hours after breakfast.

The alkaline or basic ions in the salivas from which the foregoing determinations were made would have a neutralizing power at most equal to, in Case A, of .14 cc. or N/1000 H_2SO_4 , and for B of .16 cc. of the same solution.

It is, theoretically, possible that some portion of the solid

inorganic constituents of the saliva may have basic qualities, and would be, therefore, capable of in a degree neutralizing acid ions, but as the solid inorganic constituents normally vary from 0.4 to 0.6, the neutralizing power of the inorganic solids, even assuming that they were all basic would not materially increase the total neutralizing power of the saliva for acids.

In the study of the reaction of the saliva with respect to its acid or alkaline character, we may assume that its alkalinity is a factor of its composition, as the secretion is formed in the gland, and that its acidity is ordinarily a secondary or acquired condition which is not characteristic of the secretion as it is formed in the gland, but which has developed after the secretion has been poured into the mouth as a result of the fermentative activities of oral bacteria. The exception in which the secretion shows an acid reaction at the time of its discharge from the salivary ducts is in pathological cases, notably in Arthritism, where the saliva contains di-hydrogen sodium phosphate, which salt exhibits an acid reaction to indicators.

In view then of the extremely low alkalinity of the normal saliva considered in a quantitative sense as measured by the basic ions in average normal saliva, it becomes pertinent as well as interesting to inquire into the accuracy of the frequently reported high alkaline index of the saliva. It is especially important that the neutralizing power which the basic ions of the saliva represent, should be known with some fair degree of accuracy in order that we may determine to what degree or extent the actual alkalinity of the saliva can exert a protective effect against the destructive action of acids upon the hard dental structures. The figures herein given in connection with the two salivas, A and B, in which the acid neutralizing power is recorded in terms of standard sulfuric acid solution represents an alkalinity far below that ordinarily reported, and altogether out of accord with the recently published findings of Pickerill,² whose method of determining alkalinity of the saliva was by titration with N/50 H₂SO₄, using weak methyl orange as an indicator. His figures for alkalinity are expressed in the number of cc. N/50 H₂SO₄ required to bring the methyl orange to neutral point. The discrepancy between the index of alkalinity as determined in saliva by Pickerill and the alkalinity in the

²Pickerill: Prevention of Dental Caries and Oral Sepsis. Table I, page 136.

salivas of cases A and B here under discussion, becomes evident when it is seen that the basic ions in salivas A and B would have required only .0007 and .0008, respectively, of the standard N/50 H₂SO₄ solution of Pickerill to effect their complete neutralization. That the saliva exerts a protective action against acid corrosion or disintegration of tooth structure is a fact which is sufficiently well established by copious and careful observation and experiment, but that the protective power of the saliva against acid action on tooth structure is due to the neutralization of acids by the alkalinity or basicity of the saliva, is extremely problematical.

In 1897 Professor Pavlov,³ of St. Petersburg, stated that "acids and alkalis, in marked distinction to all other chemical reagents, receive (induce a flow of) a saliva very rich in protein material. Their harmful effects on the buccal mucous membrane are thereby greatly reduced. That these measures are of use is shown by the fact that large quantities of 0.5 per cent. hydrochloric acid can be repeatedly poured into a dog's mouth without causing the least injury, whereas if the tongue be dipped in the same solution for a few minutes the epithelium peals off in a layer as if scalded."

In 1907 Dr. Joseph Head⁴ presented the results of an investigation in which he showed that the saliva exerted a very marked inhibitory influence upon the corrosive action of various acids upon tooth structure, in connection with which he stated "there are many experiments that I have made showing the power of saliva to inhibit the action of acid, and yet where such acid action is inhibited the saliva may sometimes show violent acid reaction to litmus," and he also states, "that the saliva has decided powers of protecting the teeth from acid decalcification that can hardly be explained by its contained alkaline salts."

In the *Dental Cosmos* for July, 1910,⁵ I expressed the opinion that the "protective action on the part of the saliva in the instances cited is, in all probability, due to the action of mucin, which if present in sufficient quantity clears the saliva of acid in the same way that the acid clears the saliva

³Pavlov: The Work of the Digestive Glands. American Translation, page 73.

⁴*Dental Cosmos*, Vol. XLIX, page 801.

⁵A Consideration of the Question of Susceptibility and Immunity to Dental Caries. *Dental Cosmos*, Vol. LII, page 729.

of mucin—i.e., by precipitation as an acid—mucin coagulum.” In order to determine to what extent the protective action of the saliva against acids depends upon its contained basic ions, on the one hand, and is due to its mucin content on the other, it became necessary to devise a method by which the basic ion content of the saliva could be accurately determined apart from any modifying influence which the mucin factor might exert. The factor of error, inherent in indicators, necessitated their abandonment. The method adopted was an adaptation of the principle of the hydrogen electrode, the value of which depends upon the principle that when a substance is dipped into a solution of its ions there is an electric potential between the substance and the solution, depending upon the concentration of its ions in the solution. The form of apparatus employed was that devised by Dr. Joel H. Hildebrand.⁶

Without entering into a detailed description either of the technical details of the apparatus, or of the theoretical phases of the principle involved in its application, it is sufficient for our present purposes to state that by the use of the hydrogen electrode of Hildebrand it became easily possible to obtain quickly, and with precision, records of the acidity or basicity of the saliva registered in terms of electro-motive force, giving results which are accurate quantitatively, and thus furnishing the basis for definite comparison between salivas of varying composition.

The following table will exhibit the results of a number of titrations of salivary reaction by means of the hydrogen electrode, showing variation in the salivary reaction measured in terms of E. M. F., with an interpretation of the results as related to those obtained by the use of indicators:

TABLE B.

No.	Subject.
1	Man—about 22—good health—works inside—taken 3 hours after breakfast.
2	Porter—white—about 40—poor digestion—poor teeth—taken shortly after lunch.
3	Clerk—about 50—weak stomach—taken about 2 hours after breakfast.
4	Dental expert—about 40—constant smoker—fair health—taken 2 hours after breakfast.

⁶*Proceedings VIIIth International Congress of Applied Chemistry.* Vol. I, page 217.

- 5 Lab. assistant—about 22—good health—moderate smoker—taken 2 hours after breakfast.
- 6 Dental expert—about 40—non-smoker—good health—taken 2 hours after breakfast.
- 7 Manager—about 60—heavy smoker and chewer—fair general health—pyorrhea—sample as above.
- 8 Dental expert—about 35—slight indigestion—smoker—taken as before.

Table of Hydrogen ion indices of Saliva, showing their corresponding reactions with indicators and the amount of acid or alkali necessary to make them neutral.

Saliva No.	Hydrogen ion concentration	Reaction to indicators Table Cosmos, 1911, p. 322	Neutralizing power in terms of N/100 acid or alkali.
1	1.32×10^{-8}	Rosolic acid, positive red	.00009 cc. N/100 H ₂ SO ₄
2	2.58×10^{-6}	Sodium Alizarin sulfonate turned from brown to red	.00025 " " HaOH
3	3.81×10^{-7}	Rosolic Acid—faint rose	.000038 " " "
4	2.14×10^{-8}	" " positive red	.000056 " " H ₂ SO ₄
5	7.75×10^{-9}	Phenolphthalein—faint rose	.00016 " " "
6	3.17×10^{-8}	Rosolic acid—positive red	.000038 " " "
7	3.90×10^{-7}	" " faint rose	.000039 " " NaOH
8	6.45×10^{-7}	" " "	.000065 " " "
9	2.53×10^{-9}	Phenolphthalein—faint rose	.00047 " " H ₂ SO ₄

In order to compare the results obtained by the hydrogen electrode with those obtained by titration with standard acid solution, the following titrations were made and showed the discrepancies noted in Table C:

TABLE C.

EFFECT OF ADDING SALIVA TO 10 CC. OF N/100 PHOSPHORIC ACID.

Alkalinity of Saliva used equals 4.74×10^{-6} . Normal by hydrogen electrode 1 cc. equals .00047 cc. N/100 H₂SO₄ = .00024 cc. N/50 H₂SO₄.

Alkalinity by titration with N/50 H₂SO₄ using weak Hethyl Orange as an indicator 1 cc. = .51 cc. N/50 H₂SO₄.

cc. Saliva added	H + ion conc.	cc.N/100NaOH to exactly neutralize 1 cc.	H + ion. conc. after diluting theoretical	cc.N/100NaOH to exactly neutralize	Remarks
0	3.03×10^{-3}	.303	
1	2.04×10^{-3}	.204	2.75×10^{-3}	.275	
2	$.95 \times 10^{-3}$.095	2.53×10^{-3}	.253	ppt. com- mences to form.

The alkali content of the saliva, .00000474 normal, is negligible in comparison with the change in acid concentration caused by the dilution of the solution, and can be neglected. It is evident from comparing the above results that saliva exerts a far greater neutralizing power than is indicated by its alkalinity, which can be explained by the fact that the mucin is capable of removing the acid from the solution by precipitation, this being borne out by the appearance of a white cloud in the solution on the addition of the second cc. of saliva.

It seems evident, therefore, that the index of alkalinity as determined by the method of Pickerill is, strictly speaking, not an index of alkalinity at all, but rather an index of the power of mucin to clear the saliva of its acid content by forming an acid-mucin coagulum, as suggested in my paper in 1910 already quoted.

The alkaline index of Pickerill appears to be open to further probability of error by reason of the extreme difficulty of determining the end point of the reaction owing to the unreliability of a weak solution of methyl orange as an indicator, which necessarily introduces the element of personal equation as a large factor of error in the observation.

The question of the nature of the neutralizing power of the saliva for acids is one which is not only interesting and important from a scientific point of view, but from a practical standpoint as well. From the observations herein reported as well as from those previously reported by Dr. Head, and recently by Dr. Russell W. Bunting,⁷ it seems evident that the power which the saliva possesses to rid itself of acids, and incidentally to exert a protective function against acid destruction of tooth structure, is not in any large degree, if at all, dependent upon chemical neutraliza-

⁷Dental Cosmos, Vol. LVI, page 285.

tion of the acid by the contained basic ions of the saliva, but is rather dependent almost wholly upon the precipitation by the salivary mucin as an acid-mucin coagulum. If this conclusion should be warranted by the results of further investigation, then our views with reference to the so-called alkalinity of the saliva must undergo radical modification, and among other things certain of the deductions which have in a practical way been drawn from the conclusions of Pickerill will also require modification. Thus as the result of his studies, he says:⁸ "We cannot but conclude from this that the use of alkaline dentifrices for the prevention of caries is wrong, is physiologically incorrect, unscientific, and empirical; and not only so, but also actually conducive to the inception and progress of disease, by decreasing the circulation and alkalinity of fluids in the mouth.

"The use of alkalies seems to be based upon a wrong conception. It is as though it were thought that lactic acid developed and accumulated in the mouth, remaining there for some hours or until next morning, when an overwhelmingly strong alkali is introduced to neutralize it; whereas, of course, as each molecule of lactic acid is formed, it searches for something wherewith to combine. Alkaline salts of the saliva will obviously most readily satisfy it, but should these not be available, then the calcium phosphates and carbonates of the enamel surface are utilized.

"It cannot be too clearly recognized that, by the use of alkalies, only those molecules of acid formed immediately previously can be neutralized, and also that the natural defensive forces of the mouth are thereby lowered for some considerable time afterward." But from such observations and laboratory studies as I have here reported, it would seem that lactic acid as a matter of fact does develop a coagulum in the mouth, remaining there until next morning when the "overwhelming alkalinity" of a dentifrice is properly introduced to neutralize it, and does neutralize it.

It would be interesting to know in this connection just what alkaline salts exist in the saliva that are capable of neutralizing any acid. The alkalinity of the saliva so far as I am aware is dependent upon the presence of phosphates which are alkaline to indicators, but I am unable to write any equation, and I have found no chemist who could do so, that will represent the neutralization of a free acid by a

⁸Pickerill: Prevention of Dental Caries and Oral Sepsis, page 152.

phosphate without such reaction coming out with an acid at the end. $\text{Na}_3\text{PO}_4 + \text{HCl} = \text{HNa}_2\text{PO}_4 + \text{NaCl}$. Although HNa_2PO_4 is in itself alkaline in reaction, does not change the chemical fact that it is as much an acid as HCl differing from it only in strength. If the so-called alkalinity of the saliva should eventually be found to mean merely the physical clearing of the saliva of its acid by means of a mucin coagulum, our problem with reference to the relative value of acid or alkaline dentifrices takes on a new and interesting aspect. Thus when an acid is introduced into the oral cavity, for example an acid dentifrice, it immediately stimulates, according to Pickerill, an excessive flow of so-called alkaline saliva.

Pavlov, as already quoted at the beginning of this paper, states that both acids and alkalies stimulate a flow of saliva "very rich in protein material"—i.e., a mucinous saliva, which in contact with an acid dentifrice is precipitated as an acid mucin coagulum, and which, if not removed by brushing or by neutralization with an alkali, adheres to the tooth surfaces, localizing after the manner of the plaque, an acid corrosive substance upon the teeth surfaces. Precisely the same action is noticeable in the mouths of arthritics, whose saliva contains sufficient acid sodium phosphate to precipitate the mucin upon the teeth, which in course of time brings about a destructive erosive action mainly about the necks of the teeth.

I am, therefore, unable in the light of the study here reported to agree with the conclusion of Pickerill that the use of an alkaline dentifrice "is wrong, is physiologically inaccurate, unscientific, and empirical," for it is my belief that with a clear understanding of the part which mucin plays as a protective agent in the saliva, and particularly with a better understanding of the extent to which the action of mucin has been recently regarded as a factor of alkalinity in the saliva, we shall ultimately find that Professor Pickerill's indictment applies not to alkaline, but to acid dentifrices.

Neither the important role played by the mucin content of the saliva, not only in its protective function against acid destruction of the teeth, but also in the formation of bacterial plaques in dental caries, nor the chemical relationships of mucin, appear to have been fully considered in Professor Pickerill's elaborate study of the saliva. He says:⁹

"The association observed clinically between ropy saliva and acute caries in children may be due to one or a combination of all three causes: (1) It may be a special characteristic of chronic pain associated with a 'nervous' or mental effect; (2) it may be due to the original cause of the caries —i.e., a too liberal consumption of 'free' sugar; (3) it may result from a deficient alkalinity of the saliva. It may possibly be regarded as an effort by Nature to provide a material which, if precipitated, would undoubtedly protect painful surfaces against acid stimuli."

It is difficult to understand how a ropy—i.e., mucinous saliva may result from a deficiency of alkalinity when it is well known that a deficiency of basic or alkaline salts in the saliva would mean a corresponding deficiency in mucin, upon which ropiness of the saliva depends, the solubility of the mucin being dependent upon the presence of alkaline salts. The suggestion that the ropiness of the saliva may be regarded as an effort of nature to provide a material which if precipitated would undoubtedly protect painful surfaces against acid stimuli, seems to suggest that nature is carrying on her destructive work of dental caries, graciously indicates a desire to perform the process painlessly, which may be sound theology, but is questionable science.

In presenting this subject for your consideration, I am well aware that the data are, in the present stage, merely suggestive, and that further study and experimentation are necessary in order to reach definite conclusions, but from the evidence at hand it would appear that our views regarding the so-called alkalinity of the saliva need fundamental revision, that observations upon the reaction of the saliva based upon the use of indicators of its reaction are of very questionable value, that for precise work they are useless, and, finally, that the part which mucin plays in the protection of tooth structure against corrosion by acids needs to be more fully studied before we can decide that the use of alkaline dentifrices is wrong, much less than the use of acid dentifrices is right.

In closing, I wish to acknowledge my indebtedness to my colleagues, Messrs. Crowell and Appleton, for conducting the experimental laboratory work upon which this paper is based.—*Journal Allied Dental Societies.*

⁹Pickerill: Prevention of Dental Caries and Oral Sepsis, page 183.

International Dental Federation.

GEORGE KERR THOMSON, D.D.S., HALIFAX.

CHE 1914 meeting of the International Dental Federation was held at the University of London and Hotel Cecil during the week of August 3rd.

The address of welcome was delivered by the President, Mr. W. B. Paterson, and responded to by visiting delegates. Among those present from America were: Dr. Dubeau, Canada; Drs. C. N. Johnson, T. W. Brophy, E. C. Kirk, M. L. Rhein, H. L. Wheeler, S. H. Guildford, Burkhardt and Boardman, United States. A most interesting address was delivered by the Vice-Chancellor of London University.

The report of the Hygiene Committee, dealing with the work accomplished during the year, was read by Mr. George Cunningham, Cambridge, England.

Dr. C. N. Johnson, in discussing this report, related the history of the education of the public and organization of school dental clinics in Chicago. He gave a graphic description of the voluntary work of the Chicago dentists, and the gifts of dental manufacturers, which made possible the organization of the first three school clinics; of the press campaign and publication of interviews with the school authorities regarding the value of these clinics; how by means of this campaign and without personally interviewing the members of the City Council the provision in the estimates for the transfer of these clinics to the city, and establishment of seven similar ones was passed, and more recently provision made for thirty in all.

On account of the unsettled state of the countries engaged in war, the representation from abroad was very slim. Drs. Aguilar, of Spain, and Giurini, of Italy, were among those present.

Beyond reception of reports and election of officers very little business was transacted.

My Experiences in Europe at the Outbreak of the War.

By FRED MALLORY, D.D.S., TORONTO.

MEMBERS of the dental profession who attended the Sixth International Dental Congress in London this year were doomed to disappointment. The sessions of the Congress had barely got under way when the general outbreak of war occasioned the practical abandonment of the meetings. Many of the delegates had gone over to the continent previous to the date of the Congress, and were able to return only after the greatest inconvenience and hardship.

British people generally place responsibility for the war on the Kaiser of Germany. Much discussion, however, occurred in Germany relative to the cause of the war, and all the German newspapers devoted much space to impressing the people that Germany was forced into the war, and that Germans were fighting in self defence.

In France, a week before war was declared, every railroad station, every bridge (large or small), every dock and tunnel (and these are numerous), were guarded by soldiers.

On our return to England on August 2nd, we found the same condition existed, and all sale of tickets to the continent was stopped. Thousands of Germans, Swedes, Greeks and Austrians, were stranded in London because of their inability to get passage across the Channel.

On July 30th, in Paris, conditions reached the limit. One of the most noticeable things was the lack of taxicabs, which are usually so numerous in Paris. It was said in explanation of this that every taxicab in Paris could be turned into a provision wagon in two hours, and that the government had taken a large number of the taxicabs for purposes of transport.

The worst feature in Paris was the money situation. It was beyond description. Travellers' cheques or letters of credit were practically useless. Even Bank of France notes would not be accepted in payment of a debt, and the Bank of France holds, in France, a relative position to that of the

Bank of England in London. There was a crowd, said to number 5,000 people, outside the Bank of France, trying to get gold in exchange for bank bills. In restaurants you would be asked, first thing, as soon as you sat down, if you had gold or silver, and if not, they would not serve you. In some places we saw men giving I.O.U.'s on the back of their cards in payment of their accounts. English five pound notes were no good, and even for English gold they took off 2 francs in the pound.

There were great processions down all the principal streets every night, and much cheering and singing. The whole population seemed to be filled with the idea of a certain Frenchman, to whom we were talking as a company of soldiers went past, who said: "Those soldiers are going to Berlin."

In order to leave Paris we had to accept a 2 per cent. discount on our travellers' cheques, and then only by hard coaxing would they give us enough gold or silver to barely get out of Paris. In every part of Paris, the last few days of July, there were soldiers moving in all directions, and the French people everywhere seemed to have the same idea, "anything that would beat Germany." They apparently inherited their hatred of the Germans.

We saw a very sad incident in leaving Paris. In our compartment was a young German lady about twenty-one, who was leaving her husband, and going to England to some friends, because, as her husband explained, he thought the "Little Island" about the best and safest place for her. The husband was going back to Germany to fight, and in all likelihood the husband and wife would never meet again in this world.

On leaving Calais, a great feature we noticed was the search lights at Dover. There seemed to be at least twenty of them, and the most wonderful search lights one could imagine. They were sweeping the Channel all the time, with the exception of one light, which seemed to follow our vessel. There were forty odd warships, destroyers and submarines in Dover Harbor when we arrived there, and the next day the harbor was mined and no merchant boats at all were allowed to enter.

At the hotel at Dover we met a Toronto man who had just returned from Ostend at the time we returned from Calais, and he said there was a warship every mile from Ostend to Dover. After seeing so many British warships it

seems almost impossible to think that the British fleet could be beaten. This Torontonian had lost all his baggage, as well as that of his wife, children and maids, and had almost given up hope of ever securing it.

On our return to London on August 2nd, there was great excitement among the Americans. All wanted to go home on the next boat. Because all the large and small German ships had been cancelled, every American and Canadian came to London to get a boat home. As there are no American lines of any importance, and as the English lines are all subject to the British Admiralty, one can readily see the conditions confronting the Americans. At a meeting in London it was stated that there were one hundred and sixty thousand Americans to go home from London, and as fast as one group got away, others came from the continent. The Cunard and the White Star Line, as well as the C.P.R. and Allan Lines, had to take all their return passengers home. The Cunard Line, being very heavily subsidized on all their new boats, were, of course, the worst to suffer, and no one knew when a boat was going to sail. Some sailings of boats were cancelled three hours before time of sailing, and in one case some passengers were actually on the boat. All this made conditions of Americans very bad. I heard a gentleman in front of the White Star office in London offer 300 pounds (\$1,500) for one first-class cabin out of England for America that week. Every ocean boat office was crowded to the doors, and then, when sailings were secured, the question always arose, will the government need that ship?

After being at the offices from 8 a.m. until 11, I succeeded in getting two passages on the Celtic, leaving London on August 6th, and before we left we were offered twice what we paid for them.

One is very much impressed with the faith shown by the English people in their leaders. The confidence of all classes of people in their leaders was simply marvellous.

The Englishmen were not unduly excited, but were apparently very determined that they would do their duty to the fullest, and even the doubters would have had a bad time trying to figure out a German victory in the face of all that determination and grit.

All the signs of the German business places in London were taken down, and some of the larger places, such as the Hambourg-American, etc., were all boarded up.

There were crowds on the streets in London nearly all

night. Processions along the streets were headed by the Union Jack and the French tricolor.

One day we saw a whole regiment of field artillery with their guns move along the Strand, and the excitement was intense.

I went down to the recruiting office one day and found the street crowded for two blocks with men waiting to get in. It was reported that 67,000 had joined that day. It was marvellous to see that mass of men of all ages and classes, trying to serve their country.

On the Celtic there were 890 steerage passengers, 250 of whom went over first cabin, and 632 second cabin (of whom at least one-half went over first cabin), besides 400 first cabin passengers and 650 of a crew. The cargo had to be nearly all taken out of the Celtic, as it was discovered it was contraband of war. Fully one-third of the passengers had lost all their baggage except hand baggage.

Dr. Rhind, of New York, Dr. W. A. Capon, of Philadelphia, and numbers of others, lost all their baggage. After the Celtic left Queenstown, the wireless was not used in sending messages, for fear the Germans would pick up the message and know we were in the neighborhood. On the second day out, half of the electric bulbs were taken out of the lamps on deck, and the remaining lamps were all painted white. On the third day all the bulbs were taken out except one lamp on each side of each deck, and these were covered by bags about fifteen inches long. No lights were shown at all except the headlight, starboard and port lights, and these were changed from electric lamps to small coal oil lamps that did not show much light. All port holes and windows were covered, and no one was allowed to open them. At night the course taken was two hundred miles north of the regular New York course, and when we got near the great Newfoundland Banks, we followed the shore as nearly as was possible until we reached New York, ten days from Liverpool.

The dreams of some of the passengers, which were reported as rumors, were really wonderful, and caused great excitement, especially when any other ship was sighted, as all on board were looking for Germans, though nothing was really seen of them.

A Mistake in Dental Legislation.

By E. C. KIRK, D.D.S., Sc.D.

WE are informed that the law enacted by the Legislature of Virginia, and approved March 14th, 1910, governing the practice of dentistry in that state, has been rescinded, or at least that portion of the law embraced in Section 2, which provided that "From and after January 1st, 1914, Anno Domini, the practice of this specialty in this state shall be a branch or specialty of medicine and surgery; and no person, after this act goes into effect, shall be given the examination or a certificate required by Section 4 of this act unless he shall first show to the satisfaction of the examining board provided herein that he has passed the examination provided by law for applicants to practice medicine or surgery, and has received from the Virginia State Board of Medical Examiners the certificate thereof as required by law to be given by them to such applicants." That is to say, the effort to define the nature and status of dentistry by legal enactment and to make dentists out of physicians by the same scheme, has met the fate of Belshazzar's kingdom by the analogous method of being weighed in the balance and found wanting.

How long must we suffer delays and obstruction to professional progress by the efforts of purblind enthusiasts who attempt to fit conditions to definitions rather than to adopt the plan of seeking the truth and defining it later in relation to practical results?

The section of the act herein quoted says: "From and after January 1st, 1914, the practice of this specialty (dentistry?) shall be a branch or specialty of medicine and surgery." Beautiful and reassuring as is the truth contained in this legislative pronunciamento, we cannot help asking: What was it before the act, or in what way has it been changed since the passage of the act, or how will it be changed after the reported appeal of the act that gave the dental profession in Virginia a new legal baptism and official designation? What has dentistry ever been, what will dentistry ever be, other than "a branch or specialty of medicine and surgery?" And can any conceivable legislative gyration ever make it anything else than that which it now

is and ever has been—a department or specialty of the science and art of healing, i.e., that which we group under the inclusive general term—Medicine?

It seems evident that the purpose of the re-definition of dentistry in Virginia was to enforce the “medical education” of dentists by compelling the prospective applicant for dental license to get his dental education in a medical school. Here, again, is evidence of a fundamental misconception of the broader conception of the term medical. Is not everything taught in a properly conceived and organized dental school, medical in its essence, and its purpose? If not, why not? The dental school in which the therapeutic and prophylactic ideal does not dominate and color all of its teachings would be little more than a technical trade school.

Dental schools, then, as a matter of fact, are teaching medicine in so far as it is applicable to the specialty of dentistry, and the line of advance will be to improve and expand the medical ideals of dental teaching. The expectation that the highest efficiency in dental education and practice may be attained through the training afforded by the conventional medical curriculum is a futile one, because in brief terms the medical curriculum does not fit the demands of efficient dental practice. Nor can it be made to do so, for the self-evident reason that the trend of all educational curricula is toward adaptation to special ends, mainly utilitarian, and the medical curriculum will constantly evolve toward the ideal of making better physicians, while that of dentistry will develop toward making more efficient dentists—utilizing for that purpose all of the resources of medical science and art that are adaptable to its purposes.

The rescinding of the dental statute of Virginia is significant of the practical unsoundness of the principle of making dentists through the agency of the medical curriculum.—*Cosmos*.

CHE Executive Committee of the Dental Faculties Association of American Universities has passed a resolution recommending a four years' curriculum for adoption by the schools of the Association.

The Deciduous Teeth as a Factor in Health.*

By OSCAR HAMMER, D.D.S., ST. LOUIS, MO.

CHE twenty deciduous, temporary, or primary teeth, deserve and should receive the same careful attention from a prophylactic, therapeutic, mechanical and scientific view point as usually becomes incumbent in the consideration of the permanent set. Albeit—the destructive tendencies of disorder and disease, frequent amongst the teeth in adults, may to a greater or lesser extent be looked for in the deciduous set; namely—cavity decay, pulpitis, pericementitis, various degrees and stages of abscesses, also various diseased conditions of the oral cavity, with the possible exception of pyorrhea alveolaris, though the writer has seen distinct cases of gingivitis, while irregularities of the primary teeth are rare; that is from the standpoint of contact and occlusion.

The dentist is, therefore, compelled to meet these conditions as they arise in daily practice, knowing that the correction of diseased conditions in these teeth are essential to reach and maintain healthful oral conditions, and realizing also that oral hygienic conditions are essential in maintaining in a very large measure general health.

Unnecessary to enumerate each and every phase of pathological condition of these primary teeth, it will no doubt suffice to mention a few exceptions to rules and college teachings, together with some contradictions to family traditions.

Presenting first, cases of difficult dentition, in which the family physician is usually in evidence, it is my opinion that dentists familiarize themselves with these conditions and that dentist and physician advise along these lines.

Commencing to form some months before birth the primary teeth do not begin to erupt until about the fifth to the seventh month after birth; it might, therefore, be well, in view of all that is to be considered, that dental services begin at this time.

In most cases of eruption of these teeth, matters go on

*Read before the St. Louis Dental Society May 5th, 1914.

perfectly with the possible exception of a variance of the time of appearance, either prematurely to the time, or are retarded several months; while there are cases in which no tooth has erupted until the first year and others where one and a half years have passed before there are even signs of allowing liberal deviations from rules, the entire set of teeth should be in place before the third year.

Nevertheless in some cases, before eruption of these teeth and during this period, local and systemic disorders arise; that is irritation, severe pressure and inflammatory symptoms, pain, heat, swelling and redness, resulting in loss of appetite and necessarily lack of proper nourishment and resulting in a disordered constitutional condition, which can only be remedied by systemic treatment and change of diet and the like; together with proper local treatment, such as warm applications to face, especially in the vicinity of the mouth and ear, where severe pain is usually manifested. Contrary to the opinions of many, I am a great advocate of lancing, as where the tooth is retarded by the appearance of dense tissue, an incision usually gives immediate relief. Lancing at some period, even before the tooth erupts, I have found to be beneficial, in that it relieves a pressure which sometimes causes much discomfort, loss of appetite, loss of rest by the continual irritation, although the tooth is as yet some distance from appearance. This lancing, and thorough bleeding of the gums as a rule, I find, dispels these discomforts, usually, immediately relieving the tension.

The primary teeth are not only an important factor in the conditions that lead to the correct eruption of the permanent set, but are as important to the healthful development of the child as are the normal permanent teeth to the healthful conditions of adults.

One of the first things after a child is born is the careful washing out of the oral cavity with a solution of boracic acid; this is continued for a period, but I am sorry to note is, in most cases, lost, and sometimes at the very time when the teeth commence to make their appearance; this should, however, not be the case, but this treatment should be continued by the mother or nurse until the child is able to properly brush the teeth and wash the mouth.

This is mentioned from two view points; namely, first, to form a valuable habit of oral cleanliness, and secondly, to insure against diseases of the teeth and mouth, as we are all

aware that nearly every disease germ is found in the mouth and is likely to develop more rapidly under unclean environments.

After eruption, the phase of preventive measures calls forth our efforts, and these are in the most part the obtaining and keeping healthful conditions, also oral prophylaxis, as stated before; these, however, in the most part fall short of the desired mark, therefore the dentist's mission is, to a greater extent, one of correction and restoration; correcting firstly diseased conditions or restoring lost structure.

The eruption of the deciduous teeth or dentition is a normal physiological process. Other disorders that arise during the time of dentition are only coincident with it, and are not primarily caused by the eruption of teeth. Assuming then, that during the period of dentition, the proper anti-septic care has been taken avoiding mouth infection and the like, by care of the surroundings, utensils and materials used for the purpose of feeding, etc., let us proceed to the period when all these, or nearly all, are in place. This, I believe, is the critical time concerning the child's physical development in every regard.

Therefore, the very source, that is, the means by which all that may go into the system, should be as near the ideal of perfect cleanliness as is possible. The utmost hygienic care, insuring against disease, treatment thereof when it does arise, and restoration of destruction becomes the paramount issue now, and must be accomplished by a thorough systematic procedure. Food debris that may accumulate between the teeth should be removed, destroying fermentation and rendering the micro-organisms in such a condition that further dangers to other parts become minimized by making their habitations unpopular.

Frequent examinations, impressions and models should be made noting the relative positions of these teeth, and as the child progresses in age the primary teeth are commencing to make way for the permanent teeth, radiographic negatives may be made from time to time, showing the amount of absorption that is taking place in the deciduous teeth and the position of the permanent tooth.

One of the first matters engaging our attention in the deciduous teeth is the lodgment of food in the proximal cavities of molars, causing much discomfort, dangers to further trouble and making perfect mastication impossible. This condition when brought to our notice must be cor-

rected at the earliest possible time and after careful preparation and disinfection of the cavity may be immediately restored to proper contact and occlusion, with one of the many filling materials, as cement or amalgam, as the case may indicate.

Though of rather rare occurrence, as compared with other classes of cavities, the cavities in the cervical region are generally filled immediately after careful preparation and disinfection, with a proper cement. I find these cavities are usually not as sensitive as in the permanent teeth. Simple occlusal cavities in the molars should be restored with amalgam or gold. In these cases I always use one of the forms of mat gold, on account of its rapidity and ease of manipulation.

Cavities found in the anterior deciduous teeth are amongst the most difficult that we are called upon to restore, on account of the smallness of these teeth and frailty of the walls. In these cases it many times becomes necessary to remove the pulp in order to gain proper access and retention; this, unfortunately is done in some cases where there is not as yet an encroachment upon the pulp, although where we find these cases there is already a tendency of decay so deep that to endeavor to cap or save the pulp is almost impossible.

I am compelled to add here, however, that some intelligent parents, when they observe a slight defect in the anterior teeth, are in haste to call the dentist's attention to it more rapidly than the defects would be noticed in the posterior teeth. Therefore, in this regard, and by prompt attention, many pulps are saved, and much time and pain are spared.

The materials mostly used in restoring the primary teeth are amalgam, cement and gold. In my practice I use little amalgam, however. In restoring the anterior teeth some of the forms of artificial enamel will be found to be of great value on account of harmony of color where same can be properly shaded.

Simple occlusal cavities, as stated before, are usually restored with one of the forms of mat gold, while amalgam, gold or a good copper cement is used in the restoration of proximal cavities, such as the compound mesio-occlusal, disto-occlusal, linguo-occlusal, bucco-occlusal, etc., with the virtues of copper cement predominating.

Now passing from an important phase of the subject to one of still vaster scope, the correction of pathological conditions found in these primary teeth, we are called upon first to meet the nerve-racking, peace-destroying pulpitis, inflammation of the pulp, or active hyperemia of the pulp. These cases, whether acute or chronic, should be devitalized; however, not devitalizing immediately, first, after removing outside interference, oil of cloves, eucalyptol, or eugenol should be sealed in cavity for one or two days, after which arsenic fiber should be placed in same either with a temporary stopping or a cement, one easily removed.

The use of arsenic is contrary to the opinion of many on account of subsequent dangers, nevertheless it acts quickly and I have seen no ill results therefrom when same is used with proper care.

The devitalizing agent remaining in the tooth twenty-four hours, never longer, the pulp is removed under the necessary precautions, and the canals treated as the conditions warrant, usually again sealing in oil of cloves or one of the other essential oils for a period of forty-eight hours, when the canals are filled with mummifying paste or Buckley's "Eucapercha," or a paste made of salol and cinnamon, also sometimes filling the canals with wax. All of these remedies and canal fillings allow root absorption, an important factor to be considered.

On account of the large apical opening of the deciduous teeth, the treatment of the various degrees of abscess is but a form used in the treatment of the permanent teeth, avoiding, however, the frequent use of escharotics, though when used neutralize with bicarbonate of soda, so no danger is done the delicate surrounding tissues. Where there is a fistulous discharge, after the decay is removed and cavity washed with tepid water, forcing a fifty per cent. solution carbolic acid, always neutralizing with proper agents, usually meets the requirements if followed at intervals of each day or every forty-eight hours. Before filling the canals a dressing of Black's 1-2-3 should be allowed to remain in canals one or two days, as the conditions warrant. The root canals and the tooth may now be filled.

In the treatment of abscessed and putrescent conditions of the primary teeth, there will also be found of value the following: At the first visit the pulp chamber should be opened, and a treatment of formocresol sealed in the cavity; after one or two treatments of this character the canals will

usually be found sterile, when they may be filled with a paste made of thymolized caleium phosphate mixed with the formocresol as a liquid; this is the "Buckley Method," and in most cases where same is used, absorption of the roots takes place as well as can be expected, thereby allowing the tooth to egress as easily as possible. In the treatment and filling of these primary teeth, there, of course, is a consideration of importance as valuable as the care of the permanent teeth, nevertheless, it becomes expedient at times to lay aside rules and meet the occasions as judgment demands.

Extension of cavities to points of immunity must be governed by the case at hand, age of the patient, and general conditions. Preparation of cavity and insertion of filling, etc., while not always done under the same auspices as in the permanent teeth, the rules must be followed none the less to get the best possible results, and never leaving out of consideration the proper finish of the filling to insure the best possible result and comfort.

While I have touched upon many phases concerning the deciduous teeth without going into minute detail, I would not pass to a summary of their importance without a few words regarding "extraction, an operation demanding the utmost judgment, on account of the anatomy of these teeth and pain caused in their removal."

Unless they are very loose, and there is absolutely a certainty that the operation can be done without pain, an anesthetic should be administered to avoid this pain, also for the purpose of dispelling fear for subsequent operations.

Too long retention of the deciduous teeth, as we know, is the direct cause of many irregularities in the permanent set, but I am certain that premature loss of them either by extraction or accident is a greater cause for these irregularities, hence too great stress cannot be placed on this phase of these important teeth, and they should therefore be examined at regular periods, say at least three times a year, rendering them prophylactic, restoring lost structure when necessary, and advising extraction when occasion demands.

This prophylactic treatment, after thorough examination, consists of first removing all loose roots, etc., removal of such teeth as becomes necessary at the time; here I am compelled to repeat that frequent examination is necessary on account of the divergence of the time when these teeth egress. After this is done the teeth that are diseased are

rendered in healthful condition and lost tooth structure restored. We now come to the cleaning of these teeth, another very important factor, consisting of first scaling the teeth thoroughly, removing all hard and soft accumulations around the teeth, not overlooking the occlusal surfaces where deposits accumulate in the sulci, sometimes disturbing the bite and interfering with mastication.

The cleansing of these teeth should be by means of the rubber cup and the use of Buffalo's pumice, and equal parts of calcium carbonate, the chalk modifying the coarseness of the pumice. The interdental spaces should be gone over by passing clean ligature on which is applied the cleaning material, between the space; small, narrow strips of rubber dam are sometimes used for this purpose, as in the permanent set. The gums should now be washed with a mild astringent antiseptic and followed with milk of magnesia or some other antiacid, and the child's mother or nurse instructed as to the proper home care, a factor which, if carried out properly, is also a consideration leading to the healthful economy of the child.

This smoothing or cleaning, whether it be the first or the last duty or operation, does not lose its importance.

The question oftentimes is asked why this effort, why all this attention to these temporary or primary organs, so soon to be lost? Aside from the fact that upon the proper retention of these teeth to assist in maintaining the correct relation of the jaws and their natural development, the answers are manifold and imperative.

Considering first mastication, with its disastrous results upon the stomach, when improperly performed, and it is surely incorrect if the very organs that are meant to perform these duties are decayed, diseased and broken. The stomach of a child that should be continually strengthening and developing is instead weakening, performing far more than its natural function, resulting in gastritis, indigestion and the numerous other disordered conditions, to say nothing of the other organs thereby directly or indirectly affected that may result from same, causing a general derangement which can in most cases be improved only by correcting the cause; that is why the deciduous teeth become a factor in health and all that it means. Nor is that all—the toxic poisons from pus and pus-producing germs, such as we find in abscessed and pulpless teeth, are constantly taken into the stomach, finding lodgment in the already irritated

folds, the dangers of which cannot be estimated—a depleted nervous and general physical condition.

This is true in the same conditions of the permanent teeth, and no one is disputing that it is so with the temporary set. It is a fact that in a very active child, much that may lead to deleterious effect is thrown off on account of the resistance in the stomach, which is very vascular in its construction, though in an inactive child the results are always manifest, robbing the child of many useful hours, much pleasure, strength and natural development, all vital issues in the child's comfort.

Much stress has been and is being put upon the kind and character of food children are to eat; in other words, teaching them what to eat; it would be better by far to teach them how to eat.

In the examination of children in schools much delinquency has been traced to defects in the nose, eyes, ears and other organs. I am sure that the teeth are direct or indirect contributing factors.

Regardless of what another may say on the subject, it is certain that the neglected conditions in the deciduous teeth are not confined to any one caste or class, the rich, the poor, the high, the lowly, suffering alike all through the lack of attention on the part of parents, not appreciating their value. Nature provided these teeth for a definite purpose to assist in developing the jaws, to aid in mastication, to maintain facial expression, and they are a definite factor in speech.

Therefore, too great a stress cannot be placed upon the fact that parents must care for the mouths of children, and train them until they are able to attend to these duties themselves. Form the valuable habit of oral cleanliness, thereby that habit becomes the very nature of the child. *Habitus erit naturam.*

In the researches of Heitzmann, Bödecker, Abbot and others it is claimed that the primary teeth are in an advanced stage of development before birth and are not subject to the imperfections caused by diseases of childhood. In view of this it may be said that nature really equipped the child with teeth that would not decay under clean conditions; more so I believe than is the case with the permanent set. This theory is borne out by three distinct cases coming

under my own observation. Three patients had remaining in the lower jaw the first deciduous molars. The patients were at the respective ages of twenty-two and twenty-six years. In each case every permanent tooth in the mouth was decayed, while the temporary molars remaining were found without a defect or discoloration. Therefore, it is reasonable to assume what proper care may accomplish in this regard.

Observation will show that where there is a general tendency to good health in the child, absorption of the roots will take place more perfectly than will be the case in patients that are affected by unhealthy conditions; that no doubt is due to the natural elimination of waste.

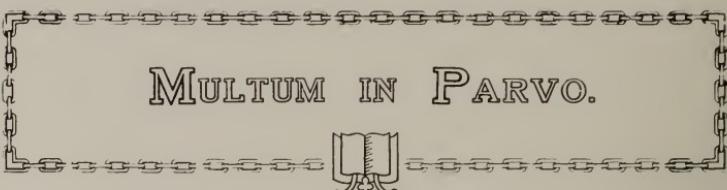
We also find that children with healthful oral conditions are not as likely to the frequent stomach disorders whether they be acute or chronic, because the stomach is doing its natural work. It might also be well to mention that in the study of school children, where there is a normally good set of teeth, nervous tendencies are in a great way lessened, and they, as a rule, get on in school work better, because they are usually possessed of perfect poise, unless, of course, there be other disorders, many of which cause serious handicaps.

Many improvements in this way can be brought about, and it goes without saying that the means are justifiable.

Our grandparents, in their lack of wisdom, dismissed the idea of anything but extraction of these primary teeth as a foolish notion. We have therefore but to observe the sign of the times, to note the gradual improvement and betterment along these lines. While not losing its importance, exodontia becomes the final and not the foremost consideration.—*Dental Review*.

Orthodontia vs. Orthodontics.

AMOST interesting discussion occurred at the recent meeting of the American Society of Orthodontists when a suggestion was made that the term "Orthodontics" be substituted for the present word "Orthodontia." Dr. Lischer lead the "debate" for the affirmative, while Dr. Ottolungui championed the negative. Honors were even, the question being laid over for one year.



MULTUM IN PARVO.



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Librarian, Royal College of Dental Surgeons of Ontario

*Helpful Practical Suggestions for publication, sent in by members
of the Profession, will be greatly appreciated by this Department.*

DEVICE FOR HEATING RUBBER.—Try a piece of clean pasteboard instead of a metallic cover to warm rubber on and you will have no sticking.—*J. C. Rice.*

TO SECURE RUBBER DAM CLAMP ON CONICALLY SHAPED TEETH.—Sandarac varnish on the tooth will give a surface over which the clamp will not slip.—*Dr. J. A. McClain.*

A QUICK METHOD OF ADJUSTING AN INLAY.—A quick and accurate way of adjusting a gold inlay, especially a large compound, is to heat same to a dull red, then cool without dropping in acid. Insert in cavity with slight rocking movement. Any prominent point will make a bright mark on the oxidized gold, showing points to be relieved.

PROPER COMPENSATION.—The average dentist has plenty of patients to work upon, but few realize from their practice compensation for their years of study and exertion and the investment sunk into their office equipment and preparation for their degree. It is acknowledged that what is most vitally needed is a condition whereby the practitioner can reduce his working hours and procure proper fees.

UNSLAKED LIME FOR DESENSITIZING HYPERSENSITIVE DENTINE (*The Dental Cos.*).—For the desensitizing of hypersensitive dentine, Calvo recommends the application of the rubber dam, drying the hypersensitive cavity by some simple means, yet leaving enough moisture in the cavity to slake a small amount of unslaked lime. A sensation of heat is perceived, which, however, disappears readily.—*Sud-Est Dentaine.*

DIFFICULTIES IN MASTICATING WITH DENTINES.—The reason why it is so difficult to masticate tough meat or crusts, is because the grinding process is essential, and this, except in very few conditions, is impossible. The usual action of the jaw with artificial teeth is up and down, consequently the "three point-contact" is practically of little importance.—*L. P. Haskell, Dental Review.*

PERMANENT FIRST MOLARS.—So often children come to us where these molars have not yet fully erupted, and we notice the enamel lobes have not properly united; there are fissures and pits, and if they are not taken care of there will be decay. The thing to do is to get them clean and dry, and work into the pits and fissures a little oxyphosphate of zinc; or, better, oxyphosphate of copper, and hold it down with the finger, thinly coated with vaseline. By keeping the fissures closed it will have a very material effect in keeping these teeth from decaying.—*G. W. Dittmar, Dental Review.*

PRICE OF PLATINUM.—When I began the use of platinum for continuous gum dentures, it was \$6 per ounce; now \$48. In 1905 the cost of metal for a case was \$25 to \$28; now it is \$50 to \$60.—*L. P. Haskell, Dental Review.*

PRESERVING PURE MERCURY.—Mercury is found in nature either pure or in combination with sulphur-cinnabar. Ordinary commercial mercury is generally alloyed with small quantities of lead, tin, etc. For dental purposes, only electrically purified mercury should be used; other brands are never chemically pure, and exert an untoward influence upon the amalgamation of metals and color of amalgam fillings. If preserved in a glass bottle under alcohol, mercury remains permanently pure and bright. If the bottle is reversed, only mercury flows out, the alcohol remaining above the heavier metal.—*Der Dental-Markt (The Dental Cosmos).*

The Cost of Porcelain Teeth.

WAR prices are not confined to food products alone. One of the results of the present war has been to raise the price of porcelain teeth. Russia controls the world's output of platinum, and there is no guarantee that the price of teeth will not be even further advanced in the near future. At this time facings have been increased in price from 25 to 31 cents, and plain teeth from 18 to 23 cents.

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EDITORIAL.

Dental Defects in Army Recruits.

IT is reported that many volunteers for the Canadian Over Seas Contingent have been rejected on account of defective teeth. The same thing occurred at the time of the South African War.

While it is unfortunate that these men present themselves in this condition, many of them could be placed in condition for active service in a very short time by an army dental surgeon.

The Army Dental Corps has received scant attention in both Great Britain and Canada. In the past the number of men volunteering for active service in war time has been so much greater than the need that numerous rejections for dental defects, while causing some comment, have not been looked upon as serious.

It may be that in this time of national peril the seriousness of this situation will sufficiently appeal to the authorities as to call for the placing of the Army Dental Corps upon a better and more useful basis.

The Late Dr. George Edwin Hunt.

IN the death of Dr. George Edwin Hunt, of Indianapolis, the dental profession of the United States loses one of its most interesting and outstanding characters. Dr. Hunt's death was sudden and altogether unexpected, resulting from an attack of acute gastritis.

Dr. Hunt was, for some years, connected with the Indiana Dental College, and its dean since 1900. He was prominent in lodge, fraternity and dental society circles, but was perhaps best known as editor of *Oral Hygiene*.

Dr. Hunt's interest and activity in the oral hygiene movement were equalled by that of but few men in the profession. He was markedly socialistic in his attitude, and this probably accounts for the fact that while others were groping for a solution of the problem of the care of children's teeth on a basis of voluntary service by the profession, Dr. Hunt saw, before many of his associates, that it was a state duty, and that only when accepted as such, and the service arranged for and paid by the state, could the problem be met.

Dr. Hunt's editorial work will be taken up by Dr. William Belcher, of Rochester, until recently editor of the *Dental Dispensary Record*, which has now ceased publication.

RECENT amendments to the sanitary code of the State of Louisiana provide for the inspection of the offices of dentists, physicians, etc., by the State Board of Health.

The amendment states that hereafter all offices, sanitaria, parlors, and other places, whether in charge of a physician, dentist, dermatologist, or other person treating or in any wise attempting to cure any human ailment, shall be subject to inspection by this board.

Such offices shall be scored for points and according to the model score card, and when such offices shall fall below fifty points upon such inspection and scoring, the board will cause to be made against the person primarily responsible for the conduct of such office, charges for the infraction of this code.

Examination Results. Dominion Dental Council.

THE Dominion Dental Council has issued the following official statement through Dr. W. D. Cowan, Secretary Treasurer:

Passed in Operative Dentistry (Practical)

Bradley, Bailey, Bricker, Chisholm, Cowan (C. H.), Duff, Gardiner, Hill, Parker, Stewart (H. A.), Spiers, Sutherland, Schwalm.

Passed in Prosthetic Dentistry (Practical)

Bradley, Bailey, Bricker, Chisholm, Cowan (C. H.), Duff, Gardiner, Hill, Parker, Stewart (H. A.), Spiers, Sutherland, Schwalm.

Passed in Operative Dentistry (Papers)

Bradley, Bailey, Bricker, Chisholm, Cowan (C. H.), Gardiner, Parker, Stewart (H. A.), Spiers, Sutherland.

Passed in Prosthetic Dentistry (Papers)

Bradley, Bailey, Bricker, Chisholm, Cowan, Gardiner, Parker, Stewart, Spiers, Sutherland.

Passed in Orthodontia

Bradley, Bricker, Chisholm, Cowan, Gardiner, Parker, Stewart, Sutherland, Tindale.

Passed in Physiology, Histology and Bacteriology

Bradley, Bagnall, Chisholm, Cowan, Fraser, Hammell, Lough, Leggo, Lawson, McClean, McCarten, Parker, Robinson, Stewart (J. A.), Spiers, Smockum, Woodbury, Wright.

Passed in Physiology and Histology only

Nicholls, Richmond.

Passed in Anatomy

Adams, Alyoe, Bier, Bailey, Bagnall, Berry, Craig, Eaid, Fraser, Gibson, Garvin, Grant, Hammell, Humphrey, Harris, Keinzie, McClean, McDonald (J. W.), Nicholls, Plunkett, Richmond, Robinson, Stewart (J. A.), Spiers, Woodbury.

Passed in Anaesthetics and Materia Medica

Bradley, Bailey, Chisholm, Cowan, Hammell, Lough, Leggo, McCarten, Parker, Robinson, Stewart (J. A.), Spiers, Smockum, Wright.

Passed in Pathology and Therapeutics

Bradley, Bricker, Hammell, Leggo, McKay (D. A. P.), Nicholls, Robinson, Spiers, Smockum, Woodbury, Wright.

Passed in Physics, Chemistry and Metallurgy

Baird, Hammell, Longh, Leggo, Lawson, McClean, McCarten, Nicholls, Robinson, Stewart (J. A.), Spiers, Smockum, Woodbury, Wright.

Passed in Physics and Chemistry only

Bagnall, Fraser, Richmond.

Passed in Medicine and Surgery

Bradley, Bailey, Bricker, Chisholm, Cowan, Gardiner, Hughes, Mustard, Parker, Stewart (H. A.), Spiers, Sutherland.

Passed in Jurisprudence and Ethics

Bailey, Bricker, Cowan, Chisholm, Parker, Stewart (H. A.), Spiers, Sutherland.

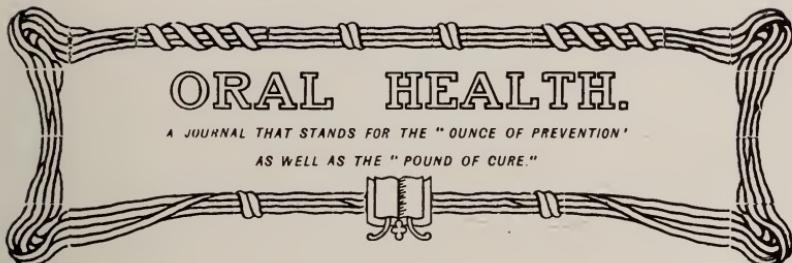
"THE BEST LESSONS A MAN
CAN LEARN ARE FROM
HIS OWN MISTAKES."

CLASS IN DENTAL PROSTHETICS

Toronto, Aug. 20th to Sept. 12th, 1914. W. E. CUMMER, D.D.S., Director.

Upper row, standing (left to right)—Doctors John Hutchison, London; G. D. Scott, Merrickville; J. Frank Adams, Toronto; Charles G. Scott, Toronto; W. A. Armstrong, Ottawa; W. S. McKay; T. P. Campbell, Galt; T. N. McGill, Toronto; Oscar W. Cannings, London; W. Westland, London
Middle row, standing—Mr. Charles L. Daly, Toronto; Doctors W. D. Staples, Hanover; George S. Cameron, McGill University, Montreal; E. W. Oliver
Almonite; Charles A. Leclair, Providence, R.I.; G. N. Howden, Watford; W. E. Lundy, Toronto; Charles Sutton, Toronto;
W. C. Greenfield, Buffalo, N.Y.; H. E. Revolds, Buffalo, N.Y.; H. E. Schlosser, Hartford, Conn., U.S.A.; Wallace Seccombe, Toronto; W. E. Cummer,
Toronto; George H. Wilson, Cleveland, Ohio, U.S.A.; M. A. R. Thomas, London; Frank C. Harwood, Moose Jaw, Sask.





VOL. 4.

TORONTO, OCTOBER, 1914

No. 10

Crown and Bridge Work.

By SYDNEY W. BRADLEY, D.D.S., RICHMOND, ONT.

WE have every reason to believe that the ancients to some degree practised the art of crowning teeth.

The first available record we have is given by Fauchard, the famous French dentist, in 1728. He used then what the laity even yet designate as the pivot tooth. Fauchard's crown was one carved to simulate the natural organ from bone or ivory, and was fastened into the root by a pivot of gold or silver. The root was previously filled with lead, into which a recess was drilled for the reception of the post. To the projecting end of this, the ivory or bone crown was cemented. Chemant, in 1816, first describes "mineral paste" teeth, which were the precursor of our modern porcelain teeth. About 1840 English tube teeth came into being. These were attached to the roots by strong hickory pins. This was a splendid restoration, if the root were in such healthy condition that alveolar abscess did not develop, or the root split in consequence of expansion, due to the pin absorbing oral secretions. To overcome the pain of abscess development after the insertion of the wood pivot, Dr. J. S. Dodge, in 1844, the year in which Horace Wells discovered the anaesthetic properties of nitrous oxide, presented the idea of inserting a piece of wood in the root canal, into which a hole was drilled for the reception of a metal dowel. Dr. Clark, a few years later, patented a crown attached by a screw-post, through which a canal was drilled—to allow the exit of gases accumulat-

ing, as a result of abscess formation. The next event of importance was the shell or telescope crown, patented by Dr. Beers in 1873; a marked advance, indeed, as it permitted the restoration of teeth without entirely destroying the crown. In 1880, Dr. Richmond patented the first porcelain crown with a band encircling the root-end to prevent its splitting. Dr. Bonwill, in 1881, patented a porcelain crown which had a hole drilled through it for the reception of the pivot, which was previously screwed into the root, and the crown then attached to the projecting end with amalgam. In 1885, Dr. M. L. Logan presented the first baked-in pin crown, which soon supplemented all others, and is still used by some practitioners. Later on, the crown invented by Dr. Davis had an extended use, because of easier adjustment, it having a separate pin and crown. The crown could be approximately fitted to the root end; the pin then cemented into the root or crown as preferred, and then final accurate adjustment made. This form of crown or similar ones are extensively used at the present time.

Where a tooth and its root were missing, we have very early accounts and examples in history of an artificial substitute being attached to the remaining teeth, by means of wires and gold bars. Modern dentistry would recognize this as bridgework. The Etruscans, who were adepts in working precious metals, showed examples of their skill in restoring lost teeth by bridgework. The Phonecians, Egyptians, Greeks and Romans also displayed some skill in this work. During the middle ages the art seems to have degenerated or been lost. F. Mauray (1828), in "A Treatise on Dental Art," shows a few illustrations of dental bridgework. Dr. W. A. Dwinelle, in 1856, showed the progenitor of the modern dental bridge, by adapting a second tooth to one which was already fastened to a cap and post in a root. In 1873 Dr. W. G. A. Bonwill gave us the first idea of a removable bridge, in having a metal tube inserted in the root, which held a threaded pin passing through a porcelain tooth. Modern bridgework, therefore, is a comparatively new science and art, it being only thirty or thirty-five years since it really came into extensive use.

The dentist's ambition with this work should be to give the maximum efficiency to the patient. He should strive to give useful and lasting service and to produce esthetic effects in his work. The restoration should be done with as

little sacrifice of the natural organs, and with the introduction of as little foreign matter as is commensurate with strength and natural appearance. We should endeavor to restore the natural size, shape and color of lost tissue as much as possible. The closer we imitate nature in our work the more beautiful and comfortable it is.

Bridgework is indicated anywhere in the mouth where there are missing teeth and roots, providing there are teeth remaining sufficiently healthy and firm, and so placed that they may be used as abutments. There are places, perhaps, where a denture might be used in preference to a bridge, but the great advantage of this class of restoration is the small space it occupies in the mouth, and hence the lessened impediment to speech and taste. The great advantage, and at the same time a disadvantage as regards oral cleanliness, is the rigidity of fixed bridgework. Some forms of fixed bridgework in an unkept mouth are nothing but pernicious food-traps.

There is another indication for bridgework, where it is of great value. With irregular teeth, and those so placed as to be of little use in mastication, may be restored to proper alignment and occlusion. This is only indicated where patients are too old, or have not the time or means to have orthodontic treatment. Also in cases of pronounced under-development of the teeth, or where they are pitted and grooved to such an extent as to be unsightly, the cast back with replaceable facing or crown, makes a strong esthetic restoration.

The first consideration necessary in deciding if a root will carry a crown, or if a number of teeth or roots may be used as abutments for a bridge is, if they are firm and healthy. Our modern methods of treating putrescent pulps places these in practically the same class as a recently devitalized one. Were we only able to treat pyorrheal conditions with the same assurance of permanent success as putrescent pulps, the problem of abutments would not cause much anxiety. Teeth or roots with alveolar abscess can be relied upon for stability, when successfully treated. When we know our roots or teeth are perfectly healthy, and surrounded by healthy tissue, the next consideration is their preparation. If it be a root for a dowel crown it must be prepared so that the crown on its labial or buccal surface will project beneath the free margin of the gum—not to such an extent that the gum or periodontal membrane are in-

jured, but far enough that no joint between root and crown is visible. If a ready-made porcelain crown be used, it must be ground to fit the periphery of the root, that when adjusted, before cementation, a fine exploring instrument will not detect overhanging edges on either root or crown. If a half band be used, the whole band being unnecessary except in cases of split roots, it must fit the root perfectly and not impinge upon the tissues. This applies to the band of a shell crown, and brings us to the preparation of a tooth for its adaptation.

If it be a healthy tooth with a vital pulp, shall we devitalize? Not if the patient be so young that the root is not fully developed, nor again if the patient be so old that this organ has receded to such an extent that the tooth may be prepared *properly* with very little or no pain. Fortunately we have few patients requiring crowns or bridgework who are so young that the roots are not fully formed. Personally I have had a few cases where incisors were broken off in play and required porcelain crowns, and another case where the anterior teeth were knocked out and the process injured by a fall. In these cases particular care was taken in sealing the apical foramina of the roots, without forcing the gutta percha points through. When satisfied that this was done properly, I constructed the remaining parts as for older patients. If a tooth be so sensitive that it cannot be properly prepared for a shell crown, devitalize. Proper preparation in many cases means the removal of a great deal of tooth tissue. For abutments for bridges, and to restore badly decayed teeth posterior to the first bicuspid, shell crowns seem to be the most suitable. If the patient be a lady, who in laughing shows the teeth, the upper ones in particular, as far back as the molars, porcelain or porcelain-faced crowns are indicated. For male patients with moustaches, gold shell crowns may be used inconspicuously, as far forward as the first bicuspid. The open-face crown as an abutment is, to my mind, a failure. I have used a few, and after six years have only seen two of these which might be said to be in as good condition as when put on. Recently I saw two centrals, open-face, carrying the laterals. These had been on twelve years, and appeared as perfect as if on only a short time. But so many are complete failures, from faulty adaptation and lack of strength, that it would be better to devitalize and use posts and inlay attachment for abutments. When the cast inlay came into general use it was thought that it might be used as an abutment. They

are a failure unless a strong iridio-platinum pin is placed in the root-canal, and mechanical retention given to the inlay. Some writers advocate small pins on either side of vital pulps. I have never used these as bridge abutments, but my experience with inlays, without any post attachment, was negative. Inlays with pins are useful restorations for incisal corners broken off. They hold here, but to carry one or more teeth, as one of the abutments, I think the pin in the root is essential in the great majority of cases. When care is taken in cleansing the root canal, and cream-white cement used in cementing the abutment, the natural color of the tooth will be preserved.

The old Richmond crown and its modification for dummies, make splendid restorations, but sometimes in soldering the shade of the facing is destroyed. If a facing of this type be broken it is a most difficult task to replace it without showing that the work is a repair. At least, it takes considerable time with any of the repair outfits we have at present. When the crown or bridge may be removed, very often an impossibility, without destroying the abutment crowns, a strong, neat repair can be made. These difficulties with the soldered facings led to different forms of removable teeth being placed upon the market. I have had experience only with the Steele and Goslee interchangeable teeth, and find them very useful, where there is sufficient room to use them. They make beautiful restorations, and as yet I have had to replace only one, a few days ago, which was easily done, and when finished was as strong and equal in appearance to the original facing.

Removable bridges are much advocated by some, and should be an excellent restoration in certain cases. They certainly enable the patient to keep the appliance and contiguous tissues in a clean, healthy condition. Where clasps are used, it is also unnecessary to destroy healthy teeth to use as abutments. This is a decided advantage. They are indicated also where there is doubt of the permanency of the abutments for fixed bridgework. They are also indicated where only one abutment is found and the appliance rests upon the soft tissues. As an example of this we have, where the eight anterior teeth are present and the others missing. Many skilled men advocate the crowning of the second bicuspid and soldering to them some form of attachment, for sale in the depots. This is good advice, if these teeth are so badly decayed that crowning is necessary, but

where they are healthy the ordinary clasp, well made and properly fitted, will hold the bridge or plate in position and preserve the life of the tooth clasped much better than where a very rigid attachment is made, which, while giving splendid service for a time, will eventually loosen these much-needed teeth. If they should decay under the clasps, or become sensitive from their friction, they can be devitalized, and if necessary filled, and another few years' usefulness added. When at last it is necessary to crown them, we can still use the ordinary clasp, the Roach, or some other form. Personally I cannot see much advantage in the attachments on sale, over clasps properly made.

Porcelain crowns and bridgework baked on platinum or iridio-platinum substructure, are beautiful restorations, where there is room for sufficient metal and porcelain to ensure strength. But with the aid of removable facings and crowns, and the casting process, as we have it perfected at present, the average dentist can produce nearly as aesthetic work as the porcelain expert. The adept can surpass in artistic results, but owing to the few opportunities there are of doing this work, I believe the vast majority resort to the removable crown with cast base, which pretty nearly approaches the ideal. Then again, if breakage occurs with the porcelain crown or bridge baked on a metal substructure, the repairing is most difficult, and in many cases impossible, a new structure being necessary.

One fault which tends to breakage of porcelains and loosening of abutments is having too deep sulci and grooves in the occlusal surface of dummies or abutment crowns. This is not at all necessary to give a good masticatory surface. Natural restoration is best, and can be produced splendidly by carving the occlusal surfaces in wax and casting. It is also advisable not to have too large occlusal surface on the dummies. Two teeth are doing the work of four, or perhaps six, generally. It will add life to them and the structure if an anatomical articulator is used, and we give the occlusal surfaces the proper form and size. The loss of masticatory function is negligible when compared with the importance of preserving the life of the abutments.

In short, crown and bridgework, to be beneficial, must be practised by a skillful, intelligent and discriminating dentist. Its usefulness is unquestionable, but its abuse has already brought our profession deserved censure from eminent medical men. We must recognize its limitations, and

not attempt the impossible. We must be honest. We have all seen the effects of dishonest, or perhaps I should say, unskillful or careless dentistry; anyone in practice for a short time has seen it, and it seems to display itself more prominently in crown and bridgework than perhaps in any other branch of our art. An example of this came under my notice recently. Two poorly adapted abutments carried a very narrow dummy, and loosened from faulty occlusion or improper cementation. The teeth carrying the abutments appeared to be perfectly sound, except for the mutilation in preparing them, which was not extensive. There was little loss of the power of mastication, as the teeth had closed in and seemed in fair occlusion. This patient would have been better to have given the dentist the fee paid for the work to have left his teeth as they were originally.

There are some other points which might rightly be considered in a paper on this subject, but I have already overstepped the allotted bounds.

American Dental Society of Europe.

GEORGE KERR THOMSON, D.D.S., HALIFAX

THE forty-first annual meeting of the above society held at the Hotel Continental, Paris, from July 30th to August 1st, inclusive, was probably one of the most successful in its history. It was really international in character, and, besides the American specialists contributing to the programme, there were present a great many from other countries who were on their way to the London Congress.

The circumstances were exceedingly favorable, and the fact that the European Orthodontia Society met the two preceding days at the same hotel, and that the Orthodontia and A. D. S. of E. clinics were held in common, on the morning of August 1st, proved an additional attraction. The various committees were well organized and everything in the way of entertainment provided to make the visitors feel "at home." Our Paris confrères certainly understand the art of entertaining.

Among those present from America were Drs. Kirk, Cryer, Guildford, Brophy, Johnson, Wheeler, Ottolengui, Case, Rhein, Capon, Jackson, Darby, Howe, Barrett, Chayes and Hawsley, of the United States, and Drs. Dubeau and Thomson, of Canada.

Although war was declared by Germany on Thursday, July 30th, the entire programme, with the exception of the automobile excursion on Saturday afternoon, and a few clinics on Saturday morning, was carried out.

The banquet by the local committee at the Restaurant Armenonville, was ideal in its arrangements, and was followed by a most enjoyable dance. The ladies were delightfully entertained at teas, musicales and luncheons by Mrs. and Miss Hirschfield, Mrs. W. S. Davenport and Mrs. Field Robinson.

The declaration of war, coming like a thunder clap as it did, was the cause of some of the members leaving for their homes before the conclusion of the meeting, and great sympathy was expressed for Dr. Hirschfield, of Paris, who was forced to leave his excellent practice, house, etc., and return to his native country, Germany. On Saturday afternoon and evening considerable excitement and inconvenience was caused, particularly in cases of Americans, who were unable to obtain money on letters of credit and travellers' cheques, the management of the hotel demanding gold or Bank of France notes in payment of accounts.

Servants of the hotel left for the front, and taxicabs were commandeered, so that guests of the hotel had great difficulty in removing baggage and reaching trains for the coast.

In fact, trunks had to be left behind, and more than one prominent American dentist had to wear "hired" clothes at the I. D. C. receptions in London.

As was the case in the Orthodontia meeting, several of the papers and clinics were repetitions of those published some years ago, but there was enough new material to make the meeting most interesting and instructive. Dr. W. A. Capon's clinic of a porcelain jacket crown for Dr. Weaver's upper right lateral attracted more attention than other clinics, and under the circumstances was accomplished in a remarkably short time. Dr. C. N. Johnson's paper, "A Pressing Need in Dentistry," was read before a large audience and caused a lively discussion, porcelain inlays and silicate cements being freely criticized. He

mentioned as the pressing need, something for the prevention of disease, but as it would probably be many years before this preventive remedy was obtained, and many more before it would be generally used, he suggested that in the meantime the present need was a better filling material for the anterior teeth than is now produced.

One of the most instructive and important events of the meeting, not mentioned in the programme, was a lecture on "Radiography in Root Canal Treatment and Filling" (with illustrations), by Dr. M. L. Rhein, of New York. It was much appreciated by a large audience, and the only criticism of Dr. Rhein's methods was that he was unnecessarily particular in some cases.

Altogether, the 1914 meeting of the A. D. S. of E. was very entertaining and instructive, in spite of the fact that several members were obliged to leave early on account of the war.

European Orthodontia Society.

GEORGE K. THOMSON, D.D.S., HALIFAX.

CHE seventh annual meeting of this society, held in Paris on July 28th and 29th, the two days preceding the meeting of the American Dental Society of Europe, was attended by specialists in Orthodontia from several countries, including England, Germany, Spain, Italy, France, United States and Canada.

The Hotel Continental was the headquarters for this society as well as the A. D. S. of E., a very convenient arrangement for those who wished to attend both meetings. The meeting was opened by an address of welcome by the chairman of the local committee, Dr. I. B. Davenport, followed immediately by the presidential address of Dr. R. Anema.

The first paper on the programme, "Bodily Movement of Teeth (illustrated), by Prof. Calvin S. Case, Chicago, provoked considerable discussion, in which Drs. E. A. Bogue, Ottolengui, Cryer and Barrett, of the United States; Thomson, of Canada; Bryant, of Switzerland; Anema, of Paris, and Chiavaro, of Rome, participated. The

majority of the ideas and illustrations contained in this paper, as well as those of Drs. Ottolengui and Pullen, of the United States, are familiar to readers of the dental magazines on this side, and no new points seemed to be established by the discussion. All agreed that "bodily movement" was desirable and necessary in certain cases, and that the various methods, if successful, were a secondary consideration.

One point of importance brought out by the discussion was that the general practitioner should be warned by specialists in Orthodontia, through the dental magazines and otherwise, of the evils of injudicious extraction. The papers of Dr. Ottolengui, and Prof. A. Chiavaro, Rome, were read consecutively, and followed by interesting discussions.

"Notes Upon the Correction of Temporary Teeth in Class III.," by Prof. Chiavaro, was an exceptional paper, well illustrated by slides and models.

His conclusions were:—

I. In Class III., of malocclusion of temporary teeth, the expansion of the upper arch only gives to the teeth the normal occlusion, and an intermaxillary traction is not necessary.

II. It is necessary to correct the malocclusion of temporary teeth in order to avoid the malocclusion of the permanent ones.

III. The correction of malocclusion of temporary teeth is done more easily and quickly than with the permanent ones, and is well borne by the small patients.

The clinics were held at the Ecole Dentaire de Paris on Saturday morning in conjunction with those of the A. D. S. of E., and included demonstrations of all the recent appliances, particularly those of Angle, with various modifications.

Among the clinics of special interest were those of Dr. H. W. Jackson, New York; Prof. Calvin S. Case, Chicago; Dr. H. A. Pullen, Buffalo; Prof. A. Chiavaro, Rome; Dr. R. Anema, Paris. Dr. Anema's method of locking the nut of the new angle appliance by pinching is very simple as well as ingenious.

Dr. Cummer's Prosthetic Class.

ON Saturday, September 12th, at noon, a unique gathering of men interested in the prosthetic side of dentistry came to a close after a successful two weeks' study, observation, practical work (both chair-side and bench-side), and "conversations" along these lines. A very happy combination of progressive and congenial men availed themselves of the opportunity provided by Dr. Cummer and his associates, the names of which are as follows: Drs. J. Frank Adams, Toronto; W. A. Armstrong, Ottawa; G. S. Cameron, McGill University, Montreal; T. F. Campbell, Galt; O. W. Canning, Toronto; W. C. Greenfield and H. E. Reynolds, both of Buffalo, N.Y.; Frank C. Harwood, Moosejaw, Sask.; G. N. Howden, Watford; John Hutchison, London; Charles A. LeClair, Providence, R.I., U.S.A.; W. E. Lundy, Toronto; T. N. McGill, Toronto; W. S. McKay, Galt; E. W. Oliver, Almonte; Hatton A. Robertson, Hamilton; R. O. Schlosser, Hartford, Conn., U.S.A.; Charles G. Scott, Toronto; G. D. Scott, Merrickville; W. D. Staples, Hanover; Charles Sutton, Toronto; M. A. R. Thomas, London, and W. S. Westland, London. Drs. Harold Clark and L. G. Smith, of Toronto; S. H. Simpson, Kingston; G. W. Everett and Spencer Clappison, of Hamilton, were prevented at the last moment from attendance.

From the beginning to the end of the two weeks' time the greatest interest and enthusiasm was manifested in the work which was planned and carried out. A sufficient number of patients was provided, giving a full upper and lower case to each three men, allowing them as much practice and experiment in any of the phases of advanced impression work and Gysi anatomical work as each saw fit. And sufficient technique covering the whole of partial denture-removable bridge construction was provided so that every moment could be utilized to advantage, resulting in a course sufficiently elastic as to suit the individual needs of each member, and giving each an opportunity of seeing the whole, and supplementing his technical equipment wherever necessary, as well as acquiring a few "demonstrating models," the result of his work. A lecture, three clinics, and five hours' infirmary and laboratory work made up the working day.

In addition to those subjects covered below, the following were included: Manipulation of all well-known laboratory materials; manipulation and use of well-known teeth and facings, etc., in prosthetics; metal bases of all kinds, full and partial; obturators; various attachments for partial denture and bridgework, including Roach, Gilmore, stud, inter-proximal clasp, rests, etc.; grinding and staining for matching natural teeth; carving and festooning with tinfoil; Webster splint for fracture, and others of minor importance.

Dr. George H. Wilson, of Cleveland, the author of the text-book which bears his name, gave a very able presentation of the subjects of Plaster, Vulcanite, and Esthetics, embodying the results of years of experiment and study of these fundamentals, including lecture, demonstrations, and lantern slides exhibit, supplemented with a collection of very fine models. Incidentally it might be noted that from recent developments, as shown by Dr. Wilson, the plaster cast or model will soon become a thing of the past in a large number of prosthetic restorations.

Dr. Wallace Seccombe presented the subject of Dental Economics. Embracing, as it does, the whole of our professional work and life apart from its technical side, those who heard these lectures could not fail to return to their respective practices with a better conception of their duty to the community, their patients, and to themselves. Specific suggestions were given as to the embodiment of these principles in daily practice. The lecture heads included: the principles of general and dental economics; the estimation of proper value of the dental service from various costs, overhead charge, etc., and from the character of the service itself, costs of various known dental operations, methods of determining the same; dental office administration and accounting, including office arrangement and equipment; choice and use of an assistant; investments; and many other details, including the application of motion study to dentistry.

The greatest interest and enthusiasm was also manifested in the Gysi system of anatomical articulation and Green-Supplee method of impression work followed by the class, and the prejudice "too complicated for the average man" very quickly disappeared as the cases advanced and the characteristically accurate and mechanically correct results became manifest.

During the class the following offices were very courteously placed at the disposal of the class for inspection, much to the interest and profit of each members: those of Drs. Capon, Colter, Coram, Cummer, Gow, Hume, McLaughlin, Mallory, McDonagh, McLean, Pearson, Stewart, Webster, Zinkan, and the laboratory of Mr. C. L. Daly.

During the session the class was the recipient of brief visits from Drs. A. E. Webster, Dean Willmott, Dr. C. N. Johnson, of Chicago, and others.

As an outcome, another class conducted upon similar lines is being organized, and is now partly filled, for the summer of 1915, embodying the results of the experience of the 1914 class, in addition to new features which will appear between now and then.

A Trip to Saint Pierre-Miquelon.

France's Smallest Colony.

By W. BERTRAND T. AMY, D.D.S., TORONTO.



FRENCH property in North America, the centre of the French cod-fishing industry on the Grand Banks, a bit of the France of Louis XIV. transported to rocky islets near Newfoundland, these exotic characteristics attracted us to Saint Pierre-Miquelon.

This group of islands, comprising Saint Pierre, Miquelon, Isle-Aux-Chiens (Isle of Dogs), and several smaller ones without inhabitants, is situated about fifteen miles off the south coast of Newfoundland, belongs to France, and contains about ninety-three square miles. They have had a chequered career. In 1660 they were formally annexed to France and were fortified in 1700. Two years later the British obtained possession and held them for sixty years, when they were restored to the French as a shelter for their fishermen.

In 1778 England recaptured them, but in five years, by the Treaty of Versailles, returned them to France. In 1793 the English again wrested them from France, and held them until 1815, when they were finally ceded to France.

These ninety-three square miles of an almost rocky, barren waste are all that remain to France of her once vast trans-Atlantic empire; an empire that at one time extended from the Atlantic Ocean to the Mississippi River. Although this is France's smallest colony, it is by no means the least important. It is the centre of France's codfishing industry on the Grand Banks, and is also of supreme importance as a nursery for her navy. It has a Governor sent from France and has a representative in the Chamber of Deputies in France. Hither each year come hundreds of fishing vessels from the ports of France, loaded with men and boys, to engage in the codfishing. In the vicinity of these islands and the Grand Banks, France has for many years been securing three-fourths of her fish supply.

The only town, Saint Pierre, situated on an island of the same name, has the sole harbor. Formed by the Isle of Dogs and the Island of Saint Pierre, it affords a safe anchorage for the fishing fleet in the inner harbor and for the men-of-war and the larger vessels in the roadstead. The town has a normal population of about 2,500, swelled to 5,000 or 6,000 during the fishing season. Not so long ago this augmented population numbered as many as 10,000, but owing to the passing of the Bait Act by Newfoundland, which prohibited the Newfoundlanders from selling bait to the French, Saint Pierre is steadily declining both in population and commercial importance. Without bait, for there is very little that can be obtained around the islands themselves, Saint Pierre will soon be but a memory and France will mourn another lost colony.

At North Sydney, one evening in August, we boarded the small steamer which carries passengers and freight from Halifax and North Sydney to Saint Pierre. After clambering over piles of lumber, barrels of sundry kinds, and sliding through a decade-old coating of grease, we finally located the purser. He consigned us to a cabin below decks, where the only articles of furniture that appealed to our admiration were French coat hooks and brass door knobs.

About one o'clock the next day, after a glorious trip except for the discomforts of the night, we approached the French islands. They presented to us a low, rocky coast

line almost devoid of vegetation, and, except for a lighthouse, without any signs of habitation. As we rounded a rocky headland the scene changed and we gazed on a picture so strange as to seem unreal. To the left was the Isle of Dogs, with its gable-roofed wooden houses; to the right, rocky Saint Pierre; in the roadstead, a French man-of-war; beyond, a fleet of fishing schooners and brigantines, each with the tri-color floating from the peak. Far back the town of Saint Pierre rose from the water's edge to a range of rocky hills which extended across the island.

At the wharf or *quai* the inhabitants had gathered to meet the steamer; a gesticulating, effervescent, elaborately polite population, clad in garments neither "Union Made," nor "Made in Canada."

After watching the acrobatic greetings exchanged between the French passengers and some of the inhabitants of the town, a couple of French boys took charge of our baggage and guided us through the narrow, hilly streets to our *pension*, situated at the corner of Rue Truguet and Rue Brisson. This was in charge of two unappropriated mesdames of uncertain age, but of certain skill with all the tools of the culinary art. If their gowns were ancient, their gesticulations French, their cooking was equally old-fashioned and equally French.

We were soon on the streets again, eager to see the sights. Saint Pierre is a duplicate of some of the quaint old towns of Brittany. It straggles along the shore of the harbor for a mile or two and climbs the hillside until the grade becomes too difficult. The houses are of wood, though some of the business structures in the main part of the town are faced with brick and stucco. The *quai* or wharf is one of the five structures in the town built of stone. The other four are official buildings. These stone buildings were built many years ago by convicts, sent out from France for the purpose. The harbor square, from which the streets radiate and around which are situated the offices of the French fishing merchants, faces the harbor. Some of the government buildings, and the offices of the two telegraph companies—the Anglo-American and the Compagnie Francaise des Cables, the latter of which has a direct wire to France—also front on this square. This square serves as a park for the town. Here all the games are played, all the trading is done, and all the meetings held. A fountain, which does not perform the work for which it was erected adorns the

square, and around its basin seats are arranged, on which questions requiring deliberation are argued.

The streets are narrow, with no sidewalks. The houses are built to the street line, and are quaint, two-storied, gable-roofed. The whole island is one great rock. The soil for the few garden plots, which add occasional bright touches to the sombre drab of the town, was brought from Newfoundland. One of the more patriotic Frenchmen had the soil for his garden brought from France.

The attention of the stranger on the street is almost immediately attracted by the number of cafes and cabarets. The cafes are for the aristocrats of the town, while the cabarets are patronized by the poorer fishermen and their friends. Here, wines of all kinds are displayed at prices that are a temptation to smugglers. For many years, whole cargoes of wines and liquors were run into Maine, Newfoundland, Cape Breton, and the villages along the St. Lawrence River. Of course, the people disclaim all knowledge of such things being done at the present time, but, if not, there must be a prodigious amount drunk in the town itself, for the quantity imported is out of all proportion to what the population should consume and live.

We made little inquisitive trips into odd apothecary shops, empty voyages into small stores and casual journeys through fish houses and into fishing schooners. We met lusty-looking fishermen in sabots, blouses and flat caps, gendarmes, the police of the islands, in resplendant uniform, young men, serving their apprenticeships for the French navy, in the fishing industry; dames, some in archaic gowns, others in modish costumes, children in cloth slippers with rope soles, a merry chattering crowd.

In a running stream on the hillside, small dams have been made at intervals, here the women kneel and wash their clothes, drying them on the rocks; one enterprising woman has secured the only wash house at one dollar a month and is doing a thriving trade subletting washing privileges for five cents a day to each woman accommodated.

A short distance from Saint Pierre, on the other side of the island, is a collection of buildings known as Ravanel. Here the old men and beach boys mend the nets and catch bait while the able bodied men are away on the Banks fishing. The beach boys are about eighteen years of age, and are sent out by the government of France to serve a three

year term in the fishing industry before entering the navy. The first year they mend nets, catch bait, and make themselves generally useful to the fish merchants to whom they are apprenticed. The second and third years they spend fishing on the Grand Banks. After this apprenticeship, for which they receive the munificent sum of thirty dollars a year with food and clothing, those who are yet alive return to France and enter the navy.

The transportation system of Saint Pierre is carried on by means of dogs and oxen. The former hitched to carts carry the smaller merchandise, while the latter move the heavier articles. There are only two or three small horses on the islands.

We spent our nights in antique four-poster beds, undisturbed by street cars or milk waggons, even the ubiquitous English sparrow was not present to herald the approach of day. As we rose to our simple French breakfast, we regretted that we were not able to transport some of this delightful peace into our strenuous city existence.

A hurried trip to Miquelon Island revealed beauties of scenery not found in Saint Pierre. We found a small settlement of people working out an existence by fishing, a little farming and dairying. Unlike the island of Saint Pierre, there is some soil with an abundance of grass. At one of the small French houses, where the kitchen floor is covered with sand, and where the members of the family stood in a row when we entered, we partook of a dinner fit for the gods. A white oil cloth covered the table—linen is not used in the French Islands either for the table or for serviettes. But what the table lacked in accessories was more than made up by the quantity and quality of the food provided: Soup, as only the French can prepare it, baked eggs, lobsters, fresh from the sea, green peas and French fried potatoes, fried chicken, lettuce with French dressing, wild strawberries with thick cream, coffee, and last, but by no means least to some of our party, four kinds of wines and liquors.

The only inconvenience in a prolonged holiday at Saint Pierre-Miquelon is the prevalence of fog. For weeks at a time these islands are enveloped in a fog so thick that it can almost be felt. But for this I know of no place in North America that is as interesting as Saint Pierre. Its quaint, medieval life charmed us, its quiet calmness rested us, and the memories of those repasts in the rambling pension and Miquelon Island will always lure us to the rocky French Islands.

Toronto Dental Rifle Association.

ON the evening of Tuesday, October 22nd, a meeting was held at the Dental College, Toronto, for the purpose of organizing a Rifle Association in connection with the dental profession. About seventy dentists were present.

Captain Osborne of the Headquarters Staff addressed the meeting, outlining the obligations assumed by an association of this kind. After hearing his address it was decided to form a Rifle Association to be known as The Toronto Dental Rifle Association. Dr. C. F. Colter was appointed Captain and Dr. Arnold Semple, Secretary. The following committee was also appointed: Drs. Peaker, Hume, Geo. Jordan, and Dalrymple.

It was decided to endeavor to procure the rifle ranges for Wednesday morning of each week. Further announcement will be made when final arrangements are completed. The officers are desirous of having all dentists join the Association. Information will be gladly furnished by either Dr. Colter, Captain (Telephone North 1996), or Dr. A. J. Semple, Secretary (Telephone College 6140).

Dr. Colter is a South African veteran and several of the other members of the Association have seen active service.

The following is a list of those who have already enrolled: Drs. Geo. Gow, Seccombe, Cowling, Sutton, Dickson, Armstrong, Baird, Rhind, Walton Ball, Zeigler, Bothwell, Rutherford, Madill, Matheson, Trotter, J. W. Coram, Davis, Kates, Floyd, Geo. Jordan, Stowe, Amy, Grieve, Jones, Reid, Grainger, Thomson, Duff, Alex. R. Jordan, Schwartz, Coyne, Howard, Brethour, Major, Loftus, Roper, Williams, Hardy, Ward, F. C. Husband, E. A. Peaker, McLean, Hume, Kennedy, Woollatt, Graham, Campbell, Phillips, Cummer, McKinley, McKenzie, Krueger, Bagshaw, Colter, Semple, T. A. Currie.

Treatment of Loose Teeth Due to Inflammatory Degeneration of the Gums and Alveolar Process.*

BY JOSEPH HEAD, M.D., D.D.S., PHILADELPHIA.

CHE disease of pyorrhea alveolaris, in spite of its name, is not always associated with a flow of pus from the infected tooth-sockets. As a matter of fact, pus does not appear in 25 per cent. of the cases. The main symptoms are inflammation of the periodental membrane, bleeding of the gums at the slightest touch, and a tendency for the teeth to elongate and be sensitive to mastication. Finally, the gums separate from the roots of the teeth, forming pockets in which salivary calculus and infection cause such centres of irritation and disintegration that the destruction of the teeth involved is only a question of time unless the tartar is removed from the roots, the mass of infection destroyed and the gums stimulated to reattach themselves to the roots of the teeth.

A single blind fistula from an infected root may cause the most profound nervous depression, which, being chronic, will be recognized only by its disappearance with the cure of fistula.

Osler, Goadby, Daland, Hunter and Billings, I believe, have not overstated the bodily ailments that time will show to be directly traced to mouth infections. That mouth infection is, in a great majority of cases, associated with Bright's disease, diabetes, cardiac, hepatic, renal and stomach disorders has been noted for a long time, but within recent years it has been shown that these disorders are, in many instances, ameliorated and, at times, entirely eradicated by the removal of the infecting foci from the mouth. My experience in the treatment of pyorrhea alveolaris with its associated tooth infections accords with these findings.

The development of medical science has now placed on the dentist not only primarily the repair and restoration of

*Read in the Section on Stomatology, of the American Medical Association, of which *The Dental Summary* is the representative organ for the dental profession by special arrangement with the *Jour. Amer. Med. Asso.*

the teeth that they may look well and give efficient power of mastication, but the responsibility of deciding whether or not patients shall be inflicted with a long list of diseases that owe their origin and existence to infections within the teeth and the adjacent tissues. This question of autotoxemia has been a great shock to the prejudice of the medical world at large, but to the dental world, trained more along purely mechanical lines, with little or no bacterial knowledge, the question of autotoxemia is no less than revolutionary. It is as though cabin-boys had suddenly awakened to find that they had been steering the ships of the human fleet without charts or knowledge of navigation, over rocks, whirlpools and mines, all the time blaming unavoidable fate for the death and disaster, when the wrecks, deaths and disasters were directly caused by their own well-meaning, blundering hands. The medical world at large cannot escape this indictment, but dentistry, inasmuch as she recommends appliances and fixtures that cannot be cleansed, that obviously may cause and perpetuate toxemia, is overwhelmed by the contemplation of the long lists of preventable diseases and the gruesome toll of deaths that her well-meant efforts may have unwittingly occasioned. The manifestly undisputed fact that the removal of non-cleansable crowns and bridges have caused the rapid disappearance of heart murmurs, violent nervous derangements, duodenal ulcer, anemia, etc., is a convincing proof of what wholesale disease had been caused by the mechanical appliances now generally recommended.

Dr. William Hunter¹ did not overestimate the danger associated with these appliances and methods. In the light of our present knowledge any dentist who puts in a bridge or crown that cannot be cleansed as thoroughly as any one of the natural teeth, or knowingly allows foci of infection to continue in the gums or root canals, is endangering the health and life of his patients, and I have no doubt that such procedure in the near future will be accounted malpractice. To be sure that there are no infecting foci, however, requires a discrimination that taxes the ability of the trained, conscientious dentist to the utmost. One canal of a molar pulp may have died, spreading infection throughout the system, while the rest of the pulp, being alive, may cause the tooth to appear normal. Pulps under fillings, though

1. Hunter, William: Oral Sepsis, *Lancet*, London, Jan. 14, 1911, p. 79.

alive, may have become infected from the decay prior to its removal and so cause a fistula, open or concealed, that on account of the living infected pulp is difficult to diagnose. Again, in case pulps have died and have been removed from teeth, especially molars, it is a matter of great nicety to be sure that all the root canals are filled so as to be free from toxemia-spreading infection. Roentgenoscopy is of great diagnostic value in these cases, but even with the Roentgen ray these are difficulties which will always require nice discrimination and judgment. There is no excuse, however, for allowing obvious fistulas to continue to discharge their contents into the mouth or blood-current. The loss of a tooth or two in comparison to the evil of such a condition is not to be considered; but as a matter of fact any conscientious, trained dentist knows that ninety-nine out of a hundred of the abscesses and fistulas can be readily cured without the loss of any teeth.

When we come to pyorrhea and pyorrhea pockets, which the great majority of dentists class as incurable, we have come to the great divide, for those dentists who shall control and cure this great scourge shall take their places in the dentistry of the future, and those who neglect this important source of human disease shall be relegated to the spheres of those who unwisely attempted that which they were unfitted to accomplish; for the cure of pyorrhea alveolaris has been more or less successfully accomplished for the last fifteen or twenty years.

While, as previously stated, pyorrhea is associated with various disturbances of which it may be the primal and continuing cause, such as gout, Bright's disease, diabetes and cardiac, hepatic and renal disorders, such specific disease as syphilis, gonorrhea, and tuberculosis, by their debilitating effect on the tissues of the mouth, may so lower the vitality of the gums that infections that otherwise would be repudiated, penetrate the periodontal membrane and by a subtle toxemia still further depress the general vital forces. This infection having penetrated the gums, forms a small abscess that partly strips away the periodontal membrane from the tooth-neck, forming a pocket, which once formed continues the disease even after the general systemic disorder may have been conquered. It is probable that some one of the numerous passing diseases, such as typhoid, measles, grip, or even a bad cold, has temporarily lowered the physical resistance of the gum tissue to the point of permitting the ever-present infection to penetrate and form

the self-perpetuating pockets, thus leaving the pyorrhea to continue without apparent systemic cause.

If the systemic cause has passed and the pyorrhea has not created a new one, the disease may perhaps be successfully treated by local means and a permanent cure hoped for; but if the pyorrhea is associated with serious general disorder, local treatment, important as it is, can be held only as a palliative and must be supplemented by judicious systemic treatment. The most important systemic treatment in the cure of pyorrhea consists in the discriminating use of vaccines that will produce antibodies in the blood as supplementary adjuncts to the proper local treatment; and yet, important and valuable as the vaccine treatment unquestionably is, without the proper local treatment that removes infecting foci and stimulates the gums to heal and reattach themselves to the roots, vaccine treatment can only reduce the severity of the symptoms; it cannot effect a cure.

About seven years ago it was my good fortune to discover that commercial hydrofluoric acid would disintegrate tartar with no macroscopic action on either cementum or enamel of an extracted tooth. The poisonous action of this acid precluded its use as a therapeutic agent to be applied to the gums. Through an extensive series of experimentation it was proved that a 23 per cent. solution of ammonium bifluorid (an acid salt of hydrofluoric acid) will disintegrate the tartar on a tooth as readily as hydrofluoric acid itself and also leave the tooth apparently unsoftened. The following is a safe, practical method for its manufacture: Twenty grams C. P. ammonium bifluoride salt should be put into a wax bottle, 10 grams C. P. hydrofluoric acid should be added and the whole filled up with water to the volume of 100 c.c. This will make a mixture of ammonium bifluoride 20 per cent., free hydrofluoric acid 10 per cent., and the rest water which is the solution desired.

The solution of ammonium bifluorid may be injected once or twice a week into pockets around loose teeth, but care must be taken not to inject it into fresh cuts, as such procedure would cause great pain. The patient should spit without rinsing the mouth with water, the saliva acting as a protection against irritation. After one or two injections the soreness and inflammation will largely disappear, and even the general symptoms of toxemia will sometimes be found to have abated. The tartar scale that could not be easily and painlessly removed at the first two treatments

will now tend to be so loosened that its thorough removal by sealers will be easy for both patient and dentist. After four or five applications, one week apart, black scales that have escaped the instruments will sometimes be found floating loose in the pockets, so that they can readily be picked out; finally, the root will become as smooth as velvet to the touch of the instrument. When this stage has been reached it will be found that the sealers cannot be so deeply carried into the pyorrhea pockets as was easily possible in the beginning. To do so causes pain and a free flow of blood. This indicates that new granulations are forming, which should not be ruthlessly broken up either by instrumentation or by injection of the bifluorid into them. Once each week the solution should be allowed to flow gently into the pockets, a procedure which results in continuous healing and is not productive of pain. Careful exploration for tartar on the root within the pocket is always advisable. Reattachment of the gum to the root, however, can be accepted as assurance that that portion of the root has been thoroughly cleansed. The scaling in that place should then be discontinued, while the weekly application of the bifluorid alone should be used. If, however, at the end of two or three months any of the pockets have not entirely healed they should be re-explored with sealers and the treatment repeated as for a new case, although by this time most of the original pockets will have disappeared, and where they existed the gums, with a slight contraction at the neck, will be found firmly adherent to the tooth. Teeth that have lost more than half of their gum attachment have become, under this treatment, firm and comfortable to the action of normal mastication.

Let us now consider some of the other means of local treatment in the cure of pyorrhea alveolaris. Loose teeth may be splinted together so as to give immobility, but this should always be done in such a manner as not to prevent thorough cleansing of the gum around their necks. Any malocclusion should be remedied so that loose teeth may be relieved of the excessive pressure of mastication due to thickening of the inflamed periodontal membrane. When a pocket has approached an apical foreman near enough to infect the pulp, the pulp should be destroyed and the root canals thoroughly sterilized and filled. This should be especially looked to in the case of molars in which the pocket extends through the bifurcation and down to the tip of one of the roots. It is sometimes excellent practice to cut the

crown midway through the grinding surface through the juncture of the roots, finally extracting the diseased root with its side to the crown. This exposes the other root or roots so that they can be filled and cleansed as easily as a bicuspid. With upper molars, if the palatal root is necrosed, this operation is most satisfactory, as it leaves the mouth, to all appearances, unchanged, and works for greater stability and more rapid recovery by not forcing the remaining root or roots to stand more than their fair share of mastication.

An excellent mouth-wash for use at home consists of a saturated aqueous solution of sodium silicofluorid which amounts to a 0.61 per cent. solution. This, when held for a minute in the mouth, morning and evening, and freely swashed for at least a minute through the teeth, is a great assistant in relieving inflammation of the gums. Like the bifluorid, it seems to restrain the deposition of tartar on the teeth, except in about 1 per cent. of cases, in which it seems to increase it slightly. But even in these cases the gums heal promptly and the superficial deposit is easily removed from the teeth with brush and pumice. The disagreeable flavor of the solution can be disguised by adding an equal amount of sodium chlorid or a judicious quantity of aromatics.

An efficient tooth-powder that will liberate enough free oxygen to make from 40 to 50 drops of a 3 per cent. peroxid solution for every 10 grains used on the brush in the mouth is as follows:

Magnesium peroxid (200 mesh sieve)	60 parts
Sodium perborate	30 parts
Castile soap and flavoring.....	10 parts

This *can* be used morning and evening for brushing the teeth and should be swashed around the interstices for a full minute before being ejected from the mouth. Without thorough cleansing and brushing of teeth and gums morning and evening antiseptic washes will be of no avail. Since the tooth-brush cannot cleanse between the teeth these surfaces should be swept free from bacterial deposits with floss silk morning and evening, and the teeth and gums thoroughly brushed with strokes not less than an inch and a half long, and rotary wherever possible. The brush should be small, not over an inch and a half long, the bristles not over a quarter of an inch, and narrow, so that when the

mouth is partly opened the brush can be placed between the ramus of the jaw and the third molars. Most brushing does not extend beyond the spring of the bristles, which, instead of giving bristle friction, merely pivots the bristles without cleansing. The upper and lower third molars more frequently decay and are subject to pyorrhea alveolaris simply because they are not cleansed. Structurally, they are not weaker than any other teeth. At each visit of a patient it is most essential that the necks of all the teeth be examined for bacterial plaques that may have been accumulating undisturbed since the last visit. The patient should be shown what movements of the brush are necessary for their removal, for a final test of a method of brushing the teeth and gums is, Does it clean away the bacterial plaques? Ninety-nine out of a hundred cleanly people never brush the thick bacterial plaques from their third molars, or, as a matter of fact, from half the other teeth, simply because they have never been taught how. Gums as well as teeth should be thoroughly brushed twice a day of all bacterial plaques. Observation on my patients proves that healthy gums are no more injured by vigorous brushing than is the skin adjacent to the finger-nails. Inflamed soft gums will unquestionably be made more sore for the first week or two, but persistence on the part of the patient and assistance on the part of the dentist in touching up the sore spots with silver nitrate will soon strengthen the gums to almost any friction the tooth-brush can give them. The question of vigorous cleansing and massaging the gums with the brush is not only a question of removing external films of infection, but is also for the purpose of producing an auto-inoculation that will create antibodies in the blood for the purpose of combating the disease, a vigorous massage of the parts causing a local hyperemia, which enables the antibodies in the blood to come into more intimate contact with the infecting bacteria. This is a most important phase in the cure of pyorrhea, and one that has not been sufficiently emphasized. The formation of antibodies for the cure of pyorrhea is a means of eradicating pyorrhea from the system. The auto-inoculation caused by vigorous gum brushing combined with the judicious use of carefully prepared vaccines have given results of a systemic improvement that are little less than marvelous.

Medical literature is so full of the reports on successful

vaccine treatment for mouth infection that they cannot but convince the most skeptical that there must be value in the treatment. Goadby's work in this field is deserving of great credit. Cummins² has published a recent article on this subject, wherein Goadby's methods are followed. The work of Leary and his associates is more in accordance with modern bacteriologic methods, however, and their reports are more in accord with the bacterial findings of this paper.

About two years ago I began the vaccine treatment as an adjunct to my local pyorrhea treatment. I was decidedly skeptical because pyorrhea does not seem to be caused by a specific bacterium, but may be caused by any one of several species, or various combinations of these. Nevertheless, from the very start such increased improvement locally and systemically was obtained that the great value of the treatment could not be doubted. The results in almost every case showed a consistent healing of the pockets and a disappearance of infection from the gums. In about 50 per cent. of the cases there was a distinct improvement in the general physical condition, which, as before stated, being chronic, was sometimes made more apparent by its absence than its presence. In the forty cases that are used as the basis of this report, the streptococcus, staphylococcus, *Bacillus influenzae*, pneumococcus, *Micrococcus catarrhalis*, diphtheroids, Friedlander bacillus and an occasional unidentified bacterium were used in the vaccines. The *Streptococcus viridans* appeared in about 25 per cent. of the cases. That the vaccines for pyorrhea alveolaries for forty cases contained such a consistent combination of similar germs for so many cases with so comparatively few unidentified strains may be partly due to the method used in collecting the specimens so as to exclude the incidental or extraneous flora of the mouth. My method will now be described.

When the infected area appeared at the tip of a root in which the pulp had died and the root canal had been filled, the culture was always taken through the root canal, which was drilled out with a fine sterilized piano-wire drill until the end was nearly reached. The canal was then sterilized with phenol (carbolic acid), wiped dry with cotton, and then blown out with hot air. When this had been accom-

2. Cummins, R. C.: *Jour. Vaccine Therap.*, March, 1913,
p. 59.

plished and the tooth had been carefully guarded with a napkin to prevent infection from the mouth, another sterilized drill was passed down to the end and then plunged through the tip into the infected area. This was then streaked over the blood-agar in the ordinary manner. At times, however, the infected area appeared near the tip of a root or roots in which the pulps were alive. In this case the root-canal method of obtaining the specimen was not feasible, so the following method was substituted: The mucous membrane over the indurated infected spot was cocaineized and a thin cautery plunged down to the bone. A sterilized bone-drill was then passed through the outer plate of the alveolar process and the patient dismissed for two days. On his return the opening in the gum, on being protected with a napkin, was cauterized with pure phenol and then wiped dry. Then the sterilized point of a small sterilized platinum-pointed glass syringe or platinum spear was inserted into the bony opening made previously by the drill, and a small drop of bloody fluid extracted, which, with due care, was transferred to the blood-agar medium. This material was supposed to contain the bacteria that had gathered for the purpose of preventing reorganization of the tissues.

To take a specimen from a pyorrhea pocket the following method was used: The neck of the tooth was first carefully washed with 95 per cent. alcohol so as to remove all outside bacteria as much as possible. The tooth was protected from mouth infection by a napkin, and then a small cup-shaped spear of thin platinum was heated to a cherry red and plunged to the bottom of the pocket. Such a procedure it was thought would get not only the pus but also a slight amount of blood from the walls of the cavity. It was thought that the hot platinum would kill any extraneous flora, while the cooled metal would carry to the blood-agar only the germs directly responsible for the disease in question. It must not be forgotten that pus is sometimes sterile, while the true cause of infection may lurk within the wall of the abscess from which the material is being obtained.

The vaccines were then made up so as to contain all the germs found, except the spore formers and the anaerobes that were not grown. While the bacteria of these classes may sometimes play a role in the infection the results of vaccine treatment indicate that in these cases their role is a minor one. The staphylococci were made to give 300

million to the cubic centimeter. Streptococci, diphtheroids, pneumococci, Micrococcus catarrhalis, Bacillus influenzae and unclassified bacteria were put in so that each would show 50 million to the cubic centimeter. In ordinary cases of chronic pyorrhea the initial dose is 75 million staphylococci and 12 million of each of the other bacteria, and the dose is steadily raised according to the reaction at the site of inoculation and the general systemic response. If the patient showed exceptional frailness or the inflammation was exceptionally acute, the initial dose was reduced to 37 million staphylococci and 6 million of each of the other bacteria. These doses were generally given a week apart in the arm, or, in thin patients, in the back.

I have not used the opsonic index in the treatment of pyorrhea alveolaris. I feel that clinical symptoms have been a sufficient guide. An interesting observation which I have not seen mentioned elsewhere is the occasional persistence of the induration which forms at the point of injection. It has appeared to me that this can be due only to a lack of digestion and absorption of the bacterial bodies. So long as the induration markedly persists we have an indication that the potentialities of the vaccine injection have not been exhausted. Therefore, further injections may be temporarily withheld or smaller doses given while absorption in the seats of induration is stimulated by massage. This method gives excellent results, and tends to minimize the danger pointed out by Allen,³ when excessive reaction is caused by doses which may have been perfectly well borne on several previous occasions. As Allen says, however, it should always be borne in mind that, if the systemic reaction lasts over twenty-four hours, it is wise to increase the interval between the doses, and a larger dose should not be given, especially if the patient makes good progress on the smaller dose.

If there is a tendency to the rapid formation of creamy tartar deposits on the teeth prior to vaccine treatment, it will be noted that, as the antibodies are formed and the gums show signs of healing, the tartar will be deposited much less rapidly and that the tartar deposited is of a more solid, removable nature and does not tend to burrow under the gum margins. This change in the deposition of tartar I have finally come to regard as a distinct symptom of the successful progress of the vaccine inoculations.

When a pyorrhea pocket shows sudden signs of inflammation during treatment it is always wise to open it surgically with a drill along the root to be sure that there is no back-pressure of pus, and that the antibodies have full opportunity to enter the seat of infection for the purpose of aiding in the cure; for, above all things, it should be remembered that the vaccine treatment can be successful only when accompanied by judicious local treatment of a surgical and therapeutic character. This applies to all foci of infection, whether in the gums or in the impaction of a bowel or anywhere else in the system. It is imperative, therefore, that there should be sympathetic co-operation with the family physician, whose intimate knowledge of the patient and whose careful diagnosis of foci of infection other than those found in the mouth will greatly increase the percentage of successes and add to the permanence of the cures.

Allen³ speaks of the value of citric acid in 30-grain doses three times a day for the purpose of softening the lymph-wall around the foci of infection by reducing the agglutinative power of the blood. I have found this treatment of service, but give it in the form of an ounce of lemon juice three times a day, which is the equivalent of about 34 grains of citric acid.

I shall now report a few detailed cases:

Cases 1 and 2.—A young man with pronounced pyorrhea and several fistulas in the gums came to me so despondent that he thought he was going to die. Local treatment caused improvement, but two of the fistulas would not heal. An autogenous vaccine was made in March, 1912, from material obtained from the worst fistula. It contained only a single strain of streptococcus. After four injections, a week apart, the patient gained in weight and then started slowly to lose weight, but as he felt better and the gums improved, the treatment was continued until June, when there was a great improvement in the gums and both fistulas had healed. In the fall the patient returned and, as he and his family physician said that the vaccine had done him so much good, I made another vaccine from a small pyorrhea pocket and obtained four strains of streptococci and a *Staphylococcus aureus*. This treatment caused a complete healing of the mouth so that it was apparently absolutely

healthy; the patient's skin cleared, he gained in weight, and felt, as he said, well. The mixed vaccine seemed most effective.

He begged me to give the vaccine treatment to his wife, who also was suffering from pyorrhea. She had almost the same experience, except she did not gain weight (her weight was normal), but her mouth showed great improvement and she slept better and felt a great lessening of nerve tension.

Case 3.—A young woman was vaccinated with a Gram-negative bacillus, fifty million to the cubic centimeter, with some improvement, but not marked. Later a second vaccine was made of *Staphylococcus aureus* and *S. albus*. The gums showed marked improvement, but the soreness around two or three teeth still persisted; the skin generally, from being itchy and showing a tendency to pimples, cleared up and, to her great delight, remained slightly and comfortable.

Case 4.—Mrs. A., aged about 50, came to me with all the teeth loose, complaining of great fatigue, trouble with the eyes, constipation and a steady loss of weight. In six months the vaccine treatment had markedly tightened the teeth and her chronic fatigue and constipation were gone; the wrinkles vanished from her skin owing to an increase of weight from 115 to 127. Her eyes, she says, were so improved that she could readily read what before was impossible or accomplished with difficulty.

Case 5.—A married woman, aged 40, who had been under my local treatment for about two years, took a vaccine last fall composed of a streptococcus. She had a complexion covered with red patches, gout in the right eye, hemoglobin 67, and great depression with constant fatigue. In six months the hemoglobin went up to 93, the gout disappeared from the eye, her complexion cleared and the gums made more progress than had previously been made in two years under local treatment. Her greatest satisfaction lay in the fact that she slept well, which, prior to the vaccine, had not been the case.

In three cases as the gums and abscesses healed marked redness of the nose disappeared. This was associated with great clearing of the complexion and a gain in weight. In other cases there was a consistent healing of the gums that seemed much more rapid than that usually obtained from

local treatment alone, but with many of them the time is too short to be sure of a permanence in cure.

In one case that refused to yield either to local or vaccine treatment a tumor of the breast was discovered. Such a depressing focus was obviously a sufficient reason for the poor results obtained, and as the patient refuses to have an operation the prognosis is not good.

Vaccine treatment judiciously used seems to be so valuable in the cases of pyorrhea that it should, in my opinion, always be given a fair trial and always in sympathetic co-operation with the family physician.—*The Dental Summary.*

1500 Locust Street.

To MAKE CORKS FIT.—Now and again the only cork at hand large enough is too large, with no cork-presser available. By boiling for five minutes the cork can be made to fit perfectly.—*Country Gentleman, per Dental Brief (Dental Cosmos).*

NEW MATERIALS FOR CASTS.—Clean trays and dip them into a pan of hot wax; then hang them up to dry. This will give the trays a thin coating of wax. Take impression in the usual manner and remove plaster from the tray by heating it over flame. Dip tray in wax solution again and hang it in place for future use. This will insure bright, clean-looking impression trays.—*E. Eustice, Dental Review.*

Certain Dental Interests in the Internal Secretions.*

BY GEORGE VAN N. DEARBORN,
Professor of Physiology, Tufts Medical and Dental Schools,
Boston; of the Philosophy of Physical Education,
Sargent Normal School, Cambridge.

DEAN PAINTER'S invitation to speak to you this evening aroused hopes of demonstrating dental interests in internal secretions, but, like the secretions themselves, the interests of dental doctors in them are more often than not internal, recondite, almost, I might say, esoteric; or so in general I suspect, for most of you realize how complex and how little understood these substances really are.

My remarks will be to you very likely in the nature of a twice-told tale, for I can do as yet truly little more than switch on the current and set the pedagogic physiological mill to grinding a more or less familiar grist. For if some few of the many medical men specializing in dentistry (the so-called dentists—who else?) have of late months developed a high-voltage interest in certain internal secretions, it none the less remains true that the majority of dental specialists in medicine have their interests in the internal secretions so deeply buried in their subterranean subconsciousness that not even the “absent treatment” of the late clever Mary Baker Glover Patterson Eddy, or the more scientific detective genius of Morton Prince, or even of Sigmund Freud himself, could discover, much less resurrect it into practical effectiveness. In direceter phrase, the dental interests in the internal secretions are apparently narrow, but somewhat deep—in spots.

You will forgive me, then, gentlemen, if I yield to the true physiologist's impulse inherent in the life he studies to talk to whomever will listen—even if he have little that is new to say. Listen, then, for a little and hear the

*Remarks made March 3, 1914, before the evening class of the Massachusetts Dental Society in the Physiologic Laboratory of the Tufts Dental School.

"wheels" begin to turn and creak and then to hum, be the grist wheat or bran!

Even in authoritative discussions on internal secretions, such as those of Biedl, of Howell, and of Sajous, one can find contradictions in a large number of pairs, and the total result in many respects is like unto the total result of research regarding the action of the nervous system: we have a deep-seated desire and much scientific eagerness to know all about it, and a hope that we may some time really understand it at least, but at the present time its mode of action is far beyond understanding. The status of the hormones and koliones is very similar indeed. So if you think you can get any more satisfactory material as a satisfier of your scientific curiosity than that I shall be able to present to you, I wish you joy in trying. I shall eagerly await the new information.

Dr. H. L. Smith, of Lynn, may have something more of much dental interest to tell you about the *thyroid gland* before long, but personally I cannot see as yet any *certain* relationship of undeniable value of the thyroid gland to practical dentistry. None the less, as Dr. Smith showed in his paper read before the Massachusetts Dental Society May 2-4, 1912, delayed dentition certainly appears sometimes promptly to yield to the administration of iodothyroin. On the other hand, the parathyroids are certainly somewhat related to the study and practice of dentistry. The parathyroids were for many years confused with the thyroid gland. There are two pairs of parathyroid glands, one pair behind the upper end of the thyroid gland and the other pair behind the lower end. For many years they were undifferentiated from the thyroid, and frequently in experimental and surgical removal of the thyroid the operators also unwittingly removed the parathyroid. It is only at a comparatively recent date that the parathyroids came to be discerned as glands entirely different and in many respects opposed to the thyroid gland in their functions. They are small, rounded and thin; usually four in number, sometimes more, and consist of a solid mass of epithelial cells which secrete a substance apparently not a "colloid," characteristic of the thyroid gland. When all the parathyroidal tissue is removed from the carnivorous animals (including man), the animal dies in from twenty-four to forty-eight hours. It has, however, recently been demonstrated (I forgot by whom) that strictly herbivorous animals do not die

from removal of the parathyroids. Physiologically, that is a very suggestive fact, and in itself most interesting, but it remains to be explained. The carnivorous animal dies in from twenty-four to forty-eight hours with symptoms of extreme irritation of the nervous system, convulsions, etc., which invariably end fatally.

In 1908, Macallum and Voegthlin showed that the injection of calcium salts counteracts the fatal action of removal of the parathyroids, and that the animal could thus be restored to apparent health, as far, at least, as these particular symptoms were concerned. Calcium salts, then, seem to prevent the toxic action of the removal of the parathyroids, which, therefore, apparently have something to do with the metabolism of lime in one way or another. Bones and teeth may obviously be concerned, but if so we do not know just how. This is all, then, that I have to say about any possible relationship of the parathyroids to dentistry: apparently they are in some way concerned with the metabolism of lime, and the teeth, of course, contain an unusually large proportion of lime.

We will now consider briefly the *adrenals*, or what were probably more often called when many of you were students the "suprarenal capsules" (a misnomer, because the adrenals in many animals are not "on top of the kidneys," as the name "suprarenal" implies; they apparently have nothing to do with the kidneys). The secretion of the adrenals is adrenalin, or epinephrin, or suprarenin; if you pay your money for it, you may take your choice of names. If you want to be really formal, however, use the term epinephrin; although the term adrenalin is that commonly used abroad, and adremin is best of all.

The injection into the circulation of adrenalin brings about the contraction of smooth muscle fibers, and thus vasoconstriction, wherever it may be, so long as the smooth muscle contains sympathetic nerve fibers in it. There are apparently two functional sets of hormones (the chief chemical materials in the internal secretions) which act on smooth muscle under different conditions, as L. F. Barker, of Johns Hopkins, has recently set forth. For example, pilocarpin acts only on smooth muscle containing *autonomic* nerve-fibers, while adrenalin, on the other hand, acts only on smooth muscle containing *sympathetic* fibers. The smooth muscle fibers in the arteries contain only sympathetic nerve-fibers, so that adrenalin, as all of you know

well, is now commonly used to bring about vasoconstriction for the purpose of checking hemorrhage. The difficulty about explaining the function of adrenalin, as that of the other hormones, in detail is largely due to the fact that it appears to work in conjunction with other internal secretions. In the metabolism of carbohydrates, for example, the adrenals seem to act with the thyroid, the pancreas, and the hypophysis, but just how, we do not know; we hope to know soon.

Unless I am in error, one of the "deepest" of the "spots" of dental interest in the hormones is close to the hypophysis cerebri (the pituitary body, "at the base of the brain") and its relation to this very matter of *carbohydrate metabolism*, to which this is an introduction. Let me first then give a brief historical sketch by way of mental orientation.

Vesalius and Galen supposed that the brain mucus was ejected through the pituitary body; that the brain secreted mucus which was excreted through the pituitary. (The word "pituitary," in fact, comes from the Latin "Pituita," meaning mucus; "hypophysis" means an undergrowth.) Later on Sylvius and Vieussens thought that the cerebro-spinal fluid was secreted by the pituitary (a good guess, according to recent research by Cushing and Goetsch). Brown-Sequard formulated the doctrine of internal secretions, and Rogowitsch showed a reciprocity between the thyroid and the pituitary. In 1886, Marie demonstrated a relation between giantism and acromegaly and pathological conditions of the hypophysis, demonstrating that disease of this organ is one at least of the underlying conditions of giantism.

In considering the pituitary we are in a sense always discussing two organs rather than one. Histologically (as Professor Bates has doubtless explained) the body is double; on the other hand, physiologically, it seems to be triple. Anatomically, it is a body about 21x14x5 mm. in size, weighing usually from 56 to 60 c.gms. in men and in nulliparaous women. In women it increases in weight with each pregnancy, 106 c.gms. being an average in women who have borne children, with a noted maximum of 165 c.gms., according to Erdheim and Stumme. The anterior lobe is a hard, bean-shaped mass, somewhat concave behind, and is the true pituitary gland, according to Biedl, as it alone contains true epithelial or gland tissue; it is developed from the

ectoderm of the mouth. The posterior lobe is smaller, rounded and soft, and is placed in the concavity of the anterior lobe. This posterior lobe is developed in the embryo from the brain tissue, and all through life is attached thereto by the infundibulum, a prolongation of the tuber cinereum. It contains little or no brain substance, but has connective tissue and neuroglia cells, which together constitute a stroma unusually loose in texture. Most of the mass of the posterior lobe, according to histologists, is of the nature of neuroglia, which is one of the greatest mysteries at the present time of the whole profoundly mysterious nervous system. It is composed of spider-shaped cells, which some used to think were a sort of packing cells (a kind of excelsior!) for the nerve cells; nowadays they are inclined to think that the neuroglia cells are of a truly nervous nature, but how or why or wherefore is all inconceivable. It is not as yet at all certain, however, by any means, that these cells of neuroglia are truly *neural* cells, despite Ramon y Cajal's skilled opinion. The inner or nervous part of the posterior lobe is partly invested by a tongue-shaped extension backwards, called the pars intermedia. It is this latter part of the posterior lobe which supplies the internal secretion (from its epithelial cells), as was described by Herring in 1908. These gland cells (of the pars intermedia) invade the rounded mass of the pars nervosa, and their product (pituitrin or hypophysin) very likely is *actuated* in the nervous lobe, whence it passes on down into the ventricles of the brain and spinal cord. (This supposition was shown to be likely by Cushing and Goetsch, and corroborated by Howell.)

The secretion of the anterior lobe is concerned with the metabolism of bones and of the structural tissues generally, but at present we really have not any idea how. Inasmuch, however, as removal of the entire anterior lobe always causes death in a single day, it obviously has some other and more essential function which is as yet unsuspected.

If we were to summarize briefly the physiological actions of the posterior lobe of the hypophysis, we might suggest them under five heads:

1, Marked increase of the blood-pressure (same action as adrenalin); 2, Slowing of the heart (also same action as adrenalin has); 3, Dilatation of renal blood vessels and an increased secretion of urine (Shafer and Herring); 4, Galactogogue (stimulation of the secretion of milk, and it is

sometimes used for that purpose); 5, Decreased tolerance of sugar, sometimes producing glycosuria (Howell).

We are chiefly interested in the fifth of these apparent functions of hypophysin, the decrease of the tolerance of sugar, and sometimes causing the passing of sugar into the urine. This last function is certainly part of a syndrome, which includes the pancreas, the thyroid, and the adrenals. The internal secretion of the posterior lobe, then, is actuated by the complex apparatus of this lobe and is later on probably absorbed from the cerebrospinal fluid into the circulation. Thus much we have reason to believe scientifically is probable. Some writers, however, are not content to stop here.

Editor E. C. Kirk, of Philadelphia, for example, with all the argumentative skill so conspicuous in editors at times, in a paper before the Toronto Dental Society, Nov. 29, 1913, went quite a way further in hypothesis. This, printed in his "own" magazine, the January, 1914, *Cosmos*, attempts to make printers' ink and hypothesis temporarily take the place of experimental proof. He suggests that dental caries is due indirectly to irritation of the pituitary or hypophysis. Let us run through this hypothetical claim of Kirk's, and remember as we run that a chain is as strong only as its weakest link. I think, however, that there are at least three weak links in this particular gilded chain, and that is one reason why I think it is interesting, if not necessary, to take it up and examine it a bit.

Dr. Kirk's first hypothesis is the presence in the normal saliva of a carbohydrate in those people who are especially susceptible to caries.

We all know, of course, that some people seem entirely unsusceptible to dental decay, and so have splendid teeth, and that there are others who more or less continually suffer even from early childhood with a large share of caries. This first hypothesis that he makes (the frequent presence in saliva of a carbohydrate in susceptibles) he had not yet paused to demonstrate. He says its determination (its truth or its falsity) is a matter of fact. Why, then, does he not prove or disprove it? Abderhalden, the productive biochemist, has demonstrated for the first time recently the presence of amino-acids in the blood; he accomplished this important fact only by using many liters of blood, much more than had ever been employed before for

this purpose. The safe method might show the absence or presence of carbohydrate in the saliva of caries-susceptible people; and plenty of people could be found to furnish saliva in any quantity among the many thousand idle people in Philadelphia. His argument is based on the further hypothesis that if there is excess of sugar in the urine (glycosuria), you would also "get" it in the saliva; that in itself is a gratuitous presumption not very satisfying to a physiologist. So far as I know, at least, sugar never goes into the saliva under normal conditions. The salivary glands and kidneys are very different in structure and in function; there is especially a vast difference in their respective falls in blood pressure, and there is no pressure difference in the salivary glands similar to that in the renal vessels. The work quoted above (by Cushing, Goetsch and Jacobson) on the relations between pituitrin and glycemia has no word in it of relation between glycemia and the saliva.

Another hypothesis: The tendency to dental caries which is seen sometimes in pregnancy is due to some irritation of the pituitary. It is perfectly proper that Doctor Kirk should make such a remark, but what about other casual conditions? We are all aware that women when pregnant are rather more apt to suffer from dental caries than at other times, but there are other conditions that might bring it about. For example, a general katabolic strain (which brings about the appearance of cysts, neoplasms, etc., of many kinds). Or, a disturbance of bone metabolism by a possible action of the *anterior* lobe of the pituitary would be just as good a supposition. Or, the general hyperesthesia of the nervous system during pregnancy might be said to make carious teeth more conspicuous to the patient, thereby bringing her to the dentist's chair more often. The thyroid is well known to be very closely related to the entire generative mechanism, and these varied conditions are much more apt to be due to the thyroid than to a supposed irritation of the pituitary.

Another hypothesis: Stress of dentition irritates the posterior lobe of the pituitary. From Dr. Kirk's discussion of this point one gets the impression that we all pretty much spend our lives, at least up to the eruption of the third molars, with our nervous system literally undermined by dental strain! My experience does not tend to corroborate

rate such a supposition. But as a matter of physiology, the nerve paths of such disturbing influence are not at all obvious and remain to be pointed out. Can Kirk demonstrate any pathway by which dentition would regularly irritate the pituitary's posterior lobe? And what is "stress of dentition," anyhow, however convenient to the theorizer?

Thus a hypothetical "strain" hypothetically is hypothesized by Kirk to irritate the posterior lobe of the hypophysis, which causes a hypothetical glycemia and this a hypothetical glycoptyalism which produces a hypothetical fermentation from which lactic acid by way of bacteria causes caries (without, perhaps, either hypothesis or hypophysis).

None the less, the series of suppositions *may* be true, however unscientifically hypothetical before demonstration. Kirk, indeed, speaks of his paper as a protocol of a research he is now organizing in "the hope of experimentally determining the truth or error of the doctrine set forth." He takes the great editorial privilege of publishing (and as a "leader") a long and concatenated guess; none the less, it may prove years hence to be a good guess, for things reasonably might possibly work that way. Meanwhile we will keep the tooth-brush in the bathroom or the dressing-room within easy reach, and our cortical neurones groping—for facts. We will not, moreover, in our teaching, whether of students or of patients, cross this hypophyseal bridge until we are sure it is there.—*Items of Interest.*



PERSONAL PAGE

DR. CHARLES WALSH and Dr. A. E. Clint have joined the ranks of the benedicts. Congratulations!

Dr. H. L. Mitchener, Mahone, N.S., attached to No. 2 Clearing Hospital, is in camp at Valcartier.

Dr. Chas. A. Corrigan, of Toronto, is also in camp at Valcartier, and is going to the front attached to the Army Service Corps.

Dr. W. J. Bentley, of Sarnia, and Dr. O. G. Hassard, of Chatham, Ont., have been serving at Camp Valcartier in the capacity of dental surgeons and will go to the front with the Canadian contingent.

Dr. C. E. McLaughlin, formerly of McLaughlin & Crowe, Annapolis, N.S., has opened a dental office on Barrington Street, Halifax.

Dr. Musgrove, of Niagara Falls, was elected a member of the Ontario Legislature at the recent Provincial elections.

Our most hearty congratulations and good wishes to Dr. and Mrs. J. B. Willmott upon the fiftieth anniversary of their wedding, which they celebrated at their home early in September.

The *Vancouver World* is running a series of articles in a department known as the "Oral Health Department." This department is conducted by the Vancouver Dental Society under the auspices of the Juvenile Protection Association. Arrangements are to be made from time to time with members of the Vancouver Society to write dental articles for publication.

Manitoba News.

REPORTED BY MANLY BOWLES, D.D.S., WINNIPEG.

Provincial Board Elections.

AT the July examinations of the Manitoba Dental Board the following were successful:—C. C. Jeffrey, F. J. Knoll, M. A. McLaren, W. R. Morrison and R. J. Yeo.

Winnipeg Dental Society.

The following resolutions were unanimously passed by the Winnipeg Dental Society:—

(1) That the dental profession of Winnipeg heartily endorse the proposition to care for (gratis), as far as possible, the dental needs of the volunteers to the allied armies, and that a committee be appointed with power to make all necessary arrangements.

(2) That the members of the profession agree to care for the urgent dental needs of the families and dependants of the soldiers of the allied armies, in so far as is possible, acting in co-operation with the citizen's patriotic and relief organization, and that this matter be left in the hands of the same committee.

It would appear that similar action should be taken by the dentists throughout Canada, especially where free dental clinics do not already exist. This does not mean that extensive dental service (that would not be undertaken even if the "bread winner" was at home) should be done gratis, but that all really urgent need be attended to. The mouth should at least be maintained in a condition of health.

The Winnipeg men will be glad to know, through the pages of ORAL HEALTH, what other dentists are doing along similar lines.

MANLY BOWLES.

Book Reviews.

First Aid Dentistry. By E. P. R. RYAN, Lt. Dental Surgeon, U.S. Army. Published by P. Blakiston's Son & Co., 1012 Walnut Street, Philadelphia. \$1.25 net.

CHIS is a small book of about 150 pages, written especially for those who may be called upon to give relief to persons suffering pain of dental origin. While the methods of treatment are given at sufficient length to be readily followed, they are not burdened with lengthy descriptions. The language used is simple and direct, and free from unnecessary technical terms.

The relation of the unhygienic mouth to the general health, and the technique of mouth examination, using

mouth mirror and explorer, are discussed in the opening chapters. Greater emphasis might have been given to the importance of instructing the patient in the care of the mouth, for when a patient presents suffering pain through ignorance or neglect of his mouth, he is likely to listen to advice as to how he may avoid such conditions in future.

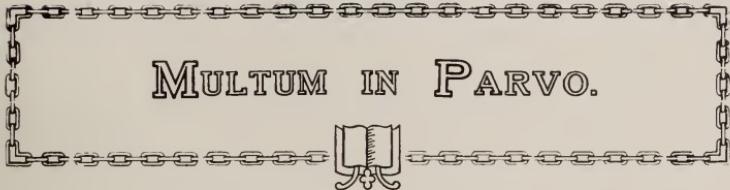
A chapter dealing with dental treatment of children and the importance of keeping their deciduous teeth comfortable and serviceable would add to the value of the book. Even as it stands, however, it should be a useful book for nurses and others engaged in dental and medical clinics, and for physicians who may be called upon to give relief dental treatment.

The illustrations, of which there are 80, are exceptionally fine, the printing is on good paper, with good type, making it a pleasure to read the book.

J. E. RHIND.



CHE above is reproduced from a photograph of Canadian and American dentists taken on board ship during their return from the International Dental Congress. Reading from left to right the names are as follows: Dr. Lemieux, Quebec; Dr. Eudore Dubeau, Montreal; Dr. Geo. K. Thomson, Halifax; Dr. W. M. Wunder, Toronto; Dr. W. B. Amy, Toronto; Dr. Truman W. Brophy, Chicago; Dr. D. J. Bagshaw, Toronto; Dr. S. S. Davidson, Ottawa; Dr. C. Harold Clarkson, Toronto; Dr. C. N. Johnson, Chicago; Dr. J. A. Bothwell, Stratford.



MULTUM IN PARVO.

This Department is Edited by C. A. KENNEDY, D.D.S., 2 College St., Toronto

Librarian, Royal College of Dental Surgeons of Ontario

Helpful Practical Suggestions for publication, sent in by members of the Profession, will be greatly appreciated by this Department.

To REMOVE EXCESS OF MERCURY IN AMALGAM FILLINGS.—Squeeze very dry that portion of amalgam that is left after filling, and hold it against the finished filling for a second; remove it, squeeze out and apply it again, until all excess of mercury is removed.—*Dr. W. B. Garrett.*

TINCTURE OF JODIN STAINS.—To remove stains of tincture of jodin from clothing, towels or napkins, immerse the stained part in *sweet* milk and let it remain a short time, after which rinse with clear water. By this process every trace of jodin can be removed.—*Dr. T. L. Hale.*

(You can also remove tincture of jodin stains with a solution of hyposulphate of soda.—The Editor.)

REPAIRING RUBBER PLATES.—The old methods of dovetail cutting, grooves, holes, etc., are entirely unnecessary. Cut out all the old rubber, and with a hot spatula pack in new agaisnt a clean-scraped surface.—*Dr. L. P. Haskell.*

RE-SOLDERING.—To prevent the unsoldering or re-fusing of parts previously united, coat such surfaces with crocus (ferric peroxid) or a solution of plumbago or whiting in alcohol or water.—*Dr. H. J. Goslee.*

To REMOVE STAINS FROM NECK OF TEETH.—In cases where the gingival third of the teeth is coated with dark and green stains, apply equal parts of tincture of aconite, tincture of jodin and chloroform. Then use a brush with pumice and, if necessary, repeat the application.—*Dr. W. C. Smith.*

TO REMOVE ADHERING PLASTER FROM VULCANITE PLATES.

—Place the plate for a short time in water containing a small quantity of sulphate of potassium.—*Dr. A. F. Isham.*

A SATISFACTORY SEPARATING FLUID.—I find equal parts of shellac and sandarae, dissolved in alcohol, a highly satisfactory separating fluid.—*V. C. Smedley, Digest.*

BECK'S BISMUTH PASTE.—Beck's Bismuth Paste, when used extensively, not uncommonly produces toxic symptoms. It should not be introduced with too great pressure and preferably where there is a short fistula.—*C. H. Clarkson, To-*

AN AID IN CARRYING PUMICE.—When using felt cones or wheels in polishing rubber plates, gold crowns, etc., hold a piece of soap against the wet cone before applying the pumice. The soap on the cone prevents too much heat and will also carry the pumice.—*Dr. D. E. Sheehan.*

DEODORIZING LARGE CAVITIES.—Large cavities in teeth can be easily deodorized by dipping a pellet of cotton, held in cotton pliers, into water, taking up a small quantity of sodium perborate, which has been placed on a porcelain or glass slab, and quickly introducing this dressing into the cavity. The oxygen developed renders the cavity odorless, and relatively aseptic.—*A. Patino, La Odontologia Colombiana (Dental Cosmos).*

SECURING PERFECT WAX MODELS FOR CAST GOLD INLAYS.—In order to secure a perfect wax model for a cast gold inlay, the wax is first trimmed to the desired shape with carving and modeling instruments. All accessible surfaces of the wax model are then wiped with a pellet of cotton dipped in oil of cajuput. The approximal surfaces are smoothed to below the gingival margin with a fine strip dipped in this oil.—*Oesterreich, Zeitschr. f. Stomatologie (Dental Cosmos).*

POLISHING ARTIFICIAL VULCANITE DENTURES.—After having filed and scraped a vulcanite plate, instead of using any sandpaper, a mixture of one part of emery powder and three parts of powdered pumice is employed for finishing and polishing, affording considerable economy in time.—*Le Laboratoire et le Progres Dentaire (Dental Cosmos).*

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Vol. 4

TORONTO, OCTOBER, 1914.

NO. 10

EDITORIAL.

Opportunities for Active Service.

ELSEWHERE in this issue will be found an account of the offer of the Winnipeg dentists to look after any dental treatment urgently required by the wives and families of volunteers who have gone to the front. This is a work that might well be taken up by the dentists of any locality where any considerable number of men have volunteered for active service.

In a recent issue of one of the Toronto daily papers there appeared a letter from a South African veteran who had volunteered for active service and had been rejected on account of the condition of his mouth only. He rather bitterly complained of his rejection upon this account. Here was a volunteer, who would undoubtedly be of more value than an untrained man, rejected for defects which might be remedied by a dentist in a very short time. It is quite possible that there are many such men being rejected at the present time who could be placed in condition for active

service by a dentist at the expense of very little time and effort. Is it not possible that the military authorities in different places, if approached in the matter, would refer to the dentists of the locality such volunteers for active service as are acceptable in every way except for certain defects in the mouth? The dentists might undertake, so far as possible, to place the mouths of such men in healthy condition, so that they might then be accepted. By such an arrangement many dentists, unable themselves to volunteer for active service, might be of real value in the present crisis in making it possible for men such as the one referred to to go to the front.

Pivot Teeth in 1877.

CHE *Scientific American* of August, 1877 (37 years ago), published an account of Dr. Bonwill's method of crowning teeth. The article appeared as follows:—

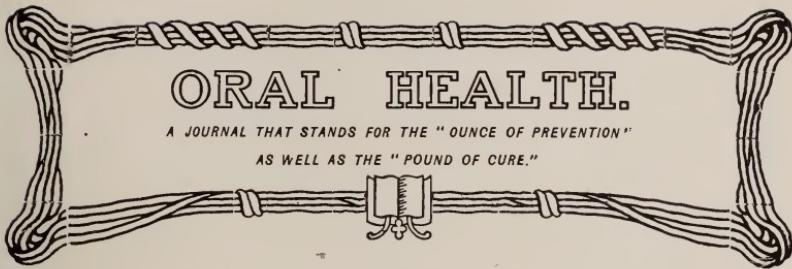
“Among the best of the inventions in the way of pivoting is a device of Dr. Bonwill's. The root is being cut down, the pulp-canal is reamed out greatly in excess of the size of the pivot that is to occupy it. A pivot made of platinum wire, upon which a screw is cut, is next fitted into the canal, and firmly packed into place through the use of amalgam. When this amalgam is set, the tooth—the pivot hole running through it—is placed upon the pivot, and is screwed solidly into place by means of a delicate nut, made of gold. It will be understood, of course, that the fitting of the tooth in position has been done at the time of setting the pivot into the root. This operation, when well accomplished, holds a pivot tooth so firmly in place that it may be used with the utmost freedom in mastication.”

CRITICISM OF THE LOOSE, THOUGHTLESS
SORT IS LIKE A TWO-EDGED, RAZOR-
BLADED KNIFE, WITH NO HILT OR GUARD;
THE HAND HOLDING IT SLIPS DOWN AND
GETS BADLY CUT.—*Sayewitz*.

Ten Proverbs of Dentistry.

BY MALCOLM W. SPARROW, D.D.S., Toronto

1. Say nothing of your confrére that you would not have him say of you.
 2. Lay carefully the foundation of true merit, and build upon it as if you were to live for ever.
 3. Look not with envious eyes upon your neighbour's practice, but attend diligently to the establishing of your own.
 4. Avoid gossip with your patient. Talk sense, or hold your peace. Above all things, say nothing that can be repeated to your detriment.
 5. Never malign another practitioner's good name, that you may the better establish yourself in the eyes of your patient, for such an unseemly method may serve eventually as a boomerang, to knock out the thrower.
 6. Vaunt not of the immensity of your earnings, lest your utterances savor of blustering prevarication. If you have a "good thing," "don't give it away," lest others may wish to share it with you, and eventually usurp it all. Besides, the tax assessor is always near at hand.
 7. As early as possible absorb it into your cranial anatomy that you are not the *ne plus ultra* in the realm of Dentistry. Others may have talents as brilliant as your own. Don't be a Dental Philistine.
 8. He who is doing his best to bring his work to the ideal standard of perfection has no time to criticize his fellow practitioners, in a spirit of jealousy. Even though he be hidden in a forest, with a reputation for superior skill, there will be a beaten pathway to his hermitage. (With apologies to Emerson).
 9. To yourself be true, to your patient courteous, and to your brother practitioner considerate, that your reputation as a gentleman may be of long duration. This is not German *kultur*, but it will suffice.
 10. And finally, when you are called upon to "shuffle off this mortal coil," leave such a goodly record that none shall pause before your tombstone, doubtful as to your address in the great beyond. Selah.
-
-



in contrast to the heterogeneous result of systemless model trimming. Dr. Angle has said, specially referring to his subject orthodontia, that "a collection of fine, accurate models is not only an incentive to keener interest and better work, but is a most valuable form of a 'library' in itself, in which many valuable phases of the subject are recorded which can be reduced to writing."

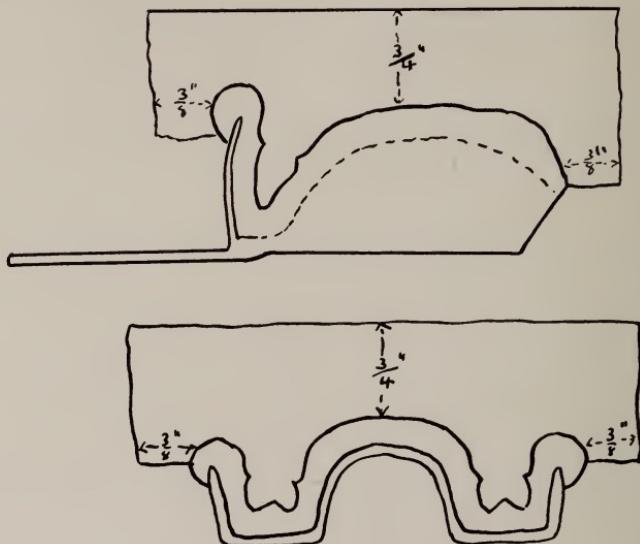


FIG. 2.

1. POURING AND REMOVING.

- A. Pour models $\frac{3}{4}$ of an inch above and $\frac{3}{8}$ past the sides of the impression.

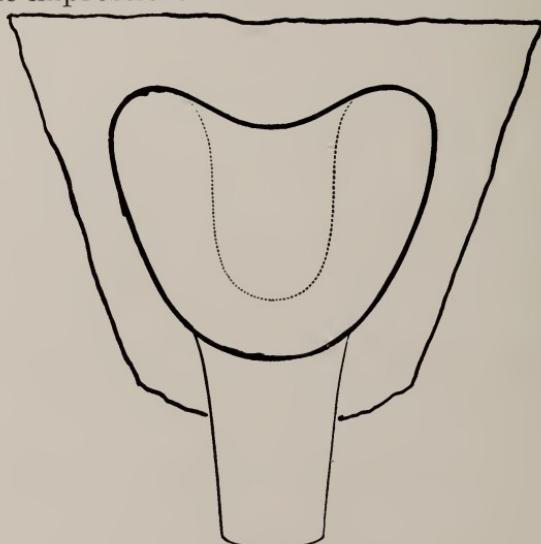


FIG. 3.

- B. Remove impression, trim model approximately as above.

2. PROPER DEPTH OF LOWER MODEL.*

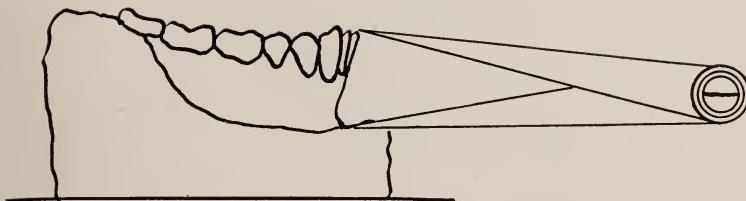


FIG. 4.

A. Take dividers and measure the greatest vertical distance on the model of anatomical portion, usually above cupid.**

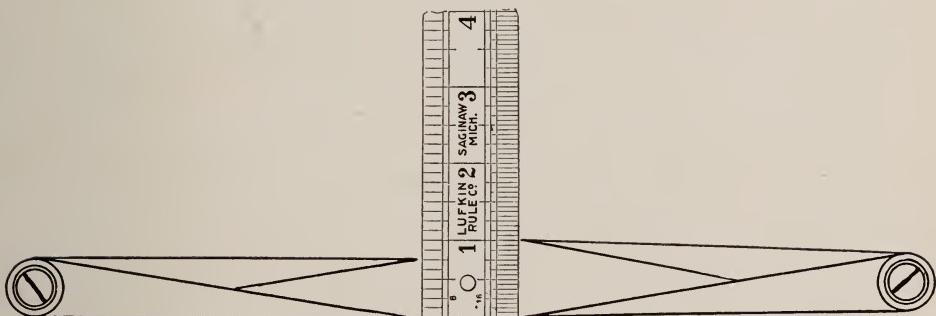


FIG. 5.

B. Lay dividers on rule and compute 1/3 more; move legs of dividers to this distance.

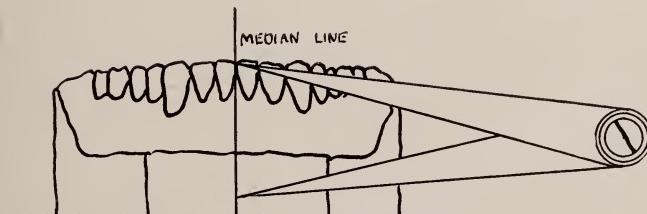


FIG. 6. (see next page)

*Lower model is entirely completed before upper is commenced.

**Art or carved portion, anatomical representing teeth, root, contours, vault, etc.

C. Transfer this distance to the model, with one leg of the dividers at the tips of the lower centrals, and the other on the uncarved portion of the model (with points both on median line). Fig. 6.

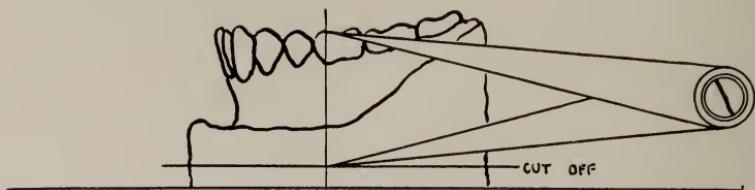


FIG. 7.

D. Mark points below mesio-buccal cusps of lower first molars the same depth as mark below incisors. Join all of these three points and trim, giving model proper depth, *and making the art portion 1/3 of the greatest anatomical portion.*

3. FORMING THE BACK OF THE LOWER MODEL.

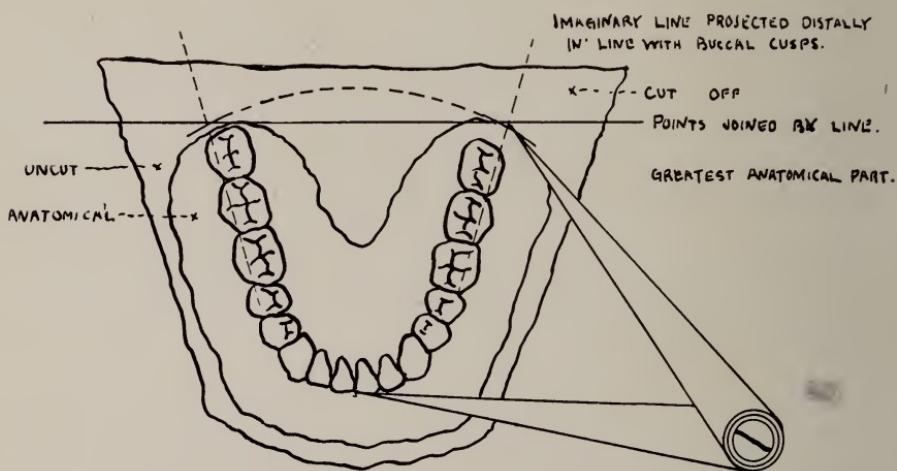


FIG. 8.

(a) Lay model on table with teeth upward, take dividers and lay off the longest distance in the anatomical portion with the contact point of centrals as centre, and cutting distally an imaginary S projected distally from the buccal cusps of the molars, (and bringing the dividers point on the uncarved portion on the side of lesser anatomical surface). Join these two points by straight line and trim model at right angles to base.

4. FORMING THE SIDES OF THE LOWER MODEL.

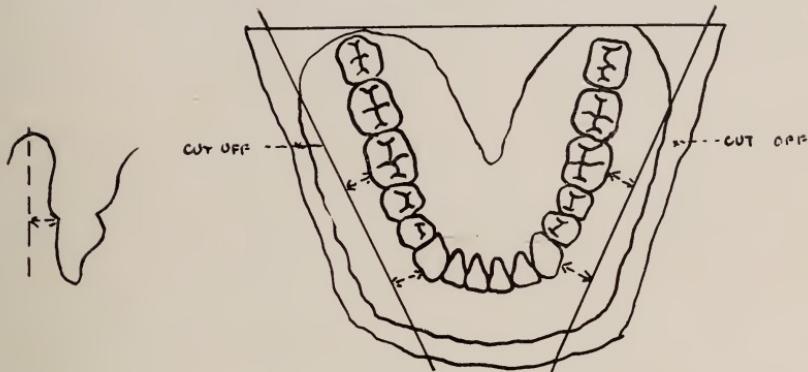


FIG. 9.

(A) Lay model on table with teeth upward, select two points the same distance laterally from the gingival portion of the lower first molar immediately below the mesio-buccal cusp and gingival portion of cuspid, including as much of the anatomical portion as needed. Join these points and extend lines, and trim at right angles to base.

5. FORMING THE FRONT OF THE LOWER MODEL.

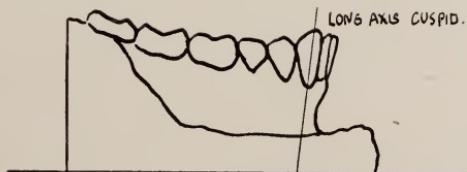


FIG. 10.

(A) On sides of model at base indicate points below and in line with the long axes of each cuspid.

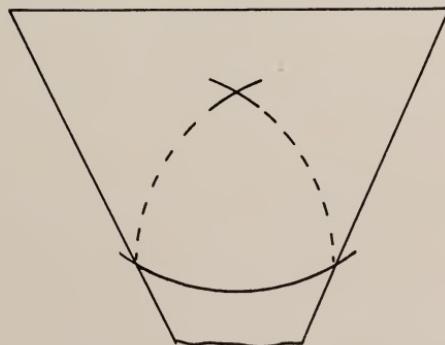


FIG. 11. (see next page)

(B) Turn model over, teeth down, and describe arcs toward the centre of the bottom of the model, and with the intersection of these arcs as centre and same radius, describe arc towards anterior part of model. Trim at right angles to the base.

6. BEVELLING DISTAL CORNERS OF MODEL.

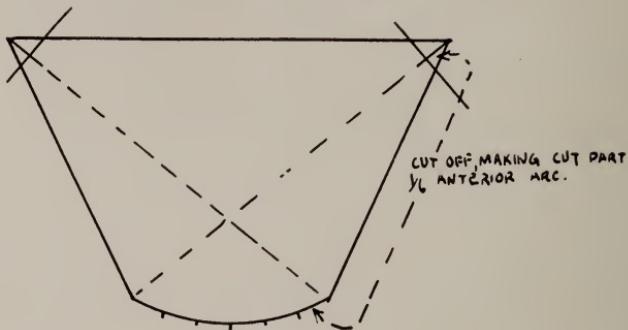


FIG. 12.

(A) Model still face down, join points over cuspid with distal corners of model, diagonally across. Cut off distal corners of model at right angles to this line and to base, making width of cut off portion $1/6$ of anterior curve previously made.

7. TRIMMING THE LINGUAL SPACE OF THE LOWER MODEL.

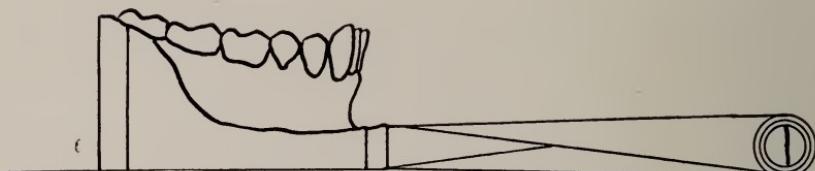


FIG. 13.

(A) Note height of art portion of the lower model anteriorly in the median line.

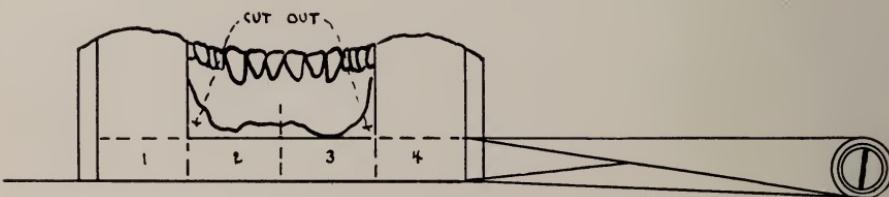


FIG. 14. (see next page)

(B) Transfer this distance to a line parallel with base on distal part of model. Divide same into four equal parts by vertical lines. Remove excess plaster of the middle two-thirds above line previously described, (Fig. 14).

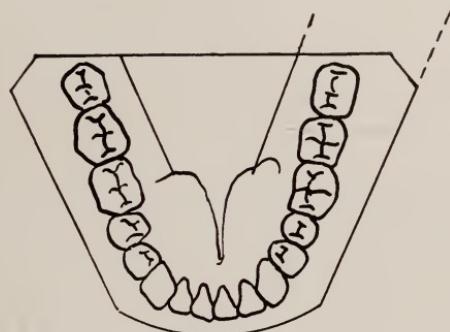


FIG. 15.

keeping cut parallel with sides of model.

8. HEIGHTH OF THE UPPER MODEL.

(A) Take upper model, note greatest anatomical portion, usually above cuspids (see lower 2 A), compute and add one-third (lower Fig. 5 and Fig. 6).

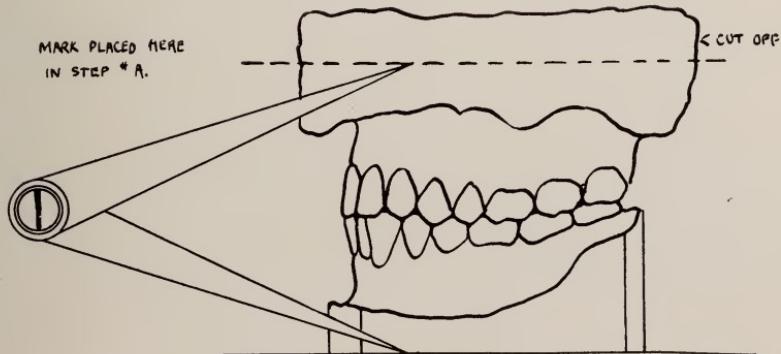


FIG. 16.

(B) Place upper on lower in position of occlusion, carry line all round with one leg of dividers on table and the other marking the uncut portion of plaster, and with the heighth of this mark (made in step A) from the table as the separation of the legs of the dividers. Remove excess plaster, thus forming top of upper model parallel with base of lower model and in position of occlusion.

9. FORMING DISTAL SURFACE OF UPPER MODEL.

(A) Determine the distal surface of upper model with dividers and rule as with lower (Fig. 8). Trim at right angles to base.

10. FORMING THE SIDES OF THE UPPER MODEL.

(A) Determine the sides of the upper model from the gingival portion of the cuspids and first molars as in Fig. 9 Lower.

11. FORMING FRONT AND BEVELLING DISTAL CORNERS OF UPPER MODEL.

(A) Produce long axes of cuspids as lower Fig. 10. Mark on upper edge of model.

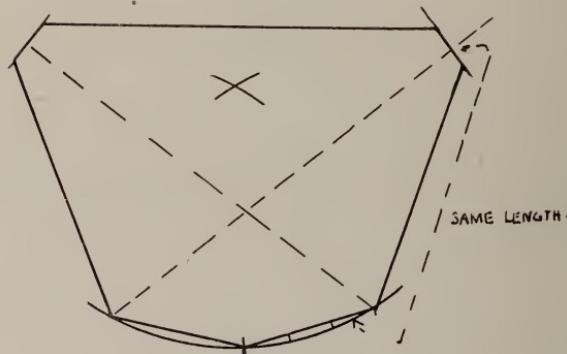


FIG. 17.

(B) Describe arcs as in Fig. 11 of Lower Model. Bisect arc, and join point of bisection with points over cuspids. Join also point over cuspids with diagonally opposite corners and cut off portion one-third the width of anterior face not identical with, but similar to Fig. 12 Lower.

12. BEVELLING JUNCTION OF ART AND ANATOMICAL PORTION.

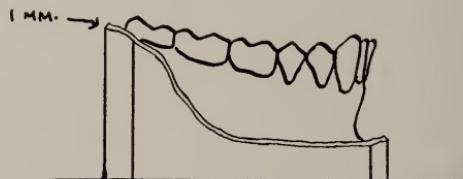


FIG. 18.

(A) Bevel slightly (with bevelled surface not more than 1 MM wide) the angle between the arc and the anatomical portion of the model.

Instruments, etc., needed::

1 Pair Dividers or Compass.

1 Rule.

1 Sharp Knife.

Sandpaper—1, 1/2, 00.

1 Try Square.

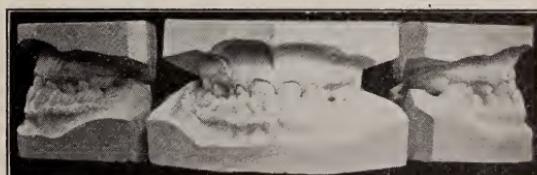
1 Hack Saw Blade.

Angle Plaster Plane or Northrop Shooting Board.

Boley Gauge, instead of Square and Rule.



Show a fine collection of models, the property of
Dr. Guy Hume.



Show a finely carved pair of models, the work of
Dr. Guy Hume.

Municipal Dental Clinics for the Adult Poor.

By J. A. BOTHWELL, D.D.S., TORONTO.



Dr. Bothwell

IT is now nearly two years since the Municipal Dental Clinic was established in Toronto for the free treatment of the teeth of poor *children*, and during this period many urgent requests have been made by *adults* to come to the clinic for free treatment. These requests came from many sources, but principally from hospitals and medical men in the city.

Because of the demand made for adult clinics, a recommendation was made last January to the Medical Health Officer to establish adult clinics in the hospitals, if arrangements for such could be made. As a result of this recommendation two hospitals were interviewed and each agreed to provide accommodation for a clinic, if the city would man it and maintain it.

The cost of equipment and maintenance were reported to the Health Officer, and after very careful consideration by him, and also by the Board of Health, it was agreed that adult clinics be established in two hospitals and that the Board of Control be asked for the money to maintain the clinics for the balance of 1914. At the last meeting of the civic Board of Control the recommendation of the Board of Health was passed and the money voted. In the near future we hope to have two clinics, one in the General and one in the Western Hospital, six half days a week each.

The clinics are to be maintained for only the needy poor who are unable to pay for dental services. Until the clinics

[EDITORIAL NOTE.—Since going to press it has been found that there is a possibility that the City Council may delay these Hospital Clinics temporarily on account of the unusual financial conditions now prevailing. The Council's final action will be announced later.—Editor.]

are well established only those patients who are suffering physically and in need of medical treatment as the result of bad teeth and an unhealthy mouth will be given attention. At the present time there is a very great need among this class of patients.

These clinics will draw the medical and dental professions closer together. They will sow the seed for a greater dentistry and a better recognition for dentistry. They will be an education to the public, the medical man and the dentist. They will fill a long-felt want by the hospitals and medical men of Toronto, as well as the dentists, and we hope that the results obtained will be as satisfactory as those we have already obtained at the Children's Municipal Clinic.

Fletcherism.

I READ a screed by Brother Fletcher on how we ought to chew our grub. I said, "It's sensible, you betcher! I'll emulate that thoughtful dub. No more like some old anaconda I'll swallow all my victuals whole; I'll eat the sort of things I'm fond o', but chew them up with heart and soul." And now I'm always at the table, I have no time to do my chores; the horse is starving in the stable, the weeds are growing out o' doors. My wife says, "Say, you should be doing some work around this slipshod place." I answer her, "I'm busy chewing—canst see the motions of my face?" I have no time to hoe the taters, I have no time to mow the lawn; though chewing like ten alligators, I'm still behind, so help me, John! I chew the water I am drinking, I chew the biscuit and the bun; I'll have to hire a boy, I'm thinking, to help me get my chewing done. Some day they'll bear me on a stretcher out to the boneyard, where they plant, and send my teeth to Brother Fletcher, to make a necklace for his aunt.—*Walt Mason.*

The Selection of Filling Materials for the Different Classes of Cavities.

By C. N. JOHNSON, M.A., L.D.S., D.D.S., CHICAGO, ILL.

(Read before the Dental Society of the State of New York,
at its annual meeting, Albany, May 14, 1914.)

MUCH as this subject has been written upon, there seems yet to be the necessity for a really definite statement or rather a restatement of the principles involved in the selection of filling materials for different cases. Back of all operative procedures there should be the well-formulated and definite aim of the operator to make such an operation as will most surely serve the best interests of his patient, and not until he has studied carefully the behavior of fillings under varying conditions is he able to select promptly and with assurance the material for a given case which will promise the best service.

It seems to be the tendency of many operators—in fact it is the tendency of humanity in general—to get into ruts, and follow any tangent which leads them along the lines of least resistance. The dentist, above all men, should guard against this tendency. Too frequently a certain method of procedure appeals to a practitioner, and he follows that method blindly in all cases, regardless of the fact that other methods might serve a better purpose in given instances. A close study of the behavior of filling materials in different classes of cavities is necessary before an operator can determine what is the proper material to be used in all cases, and it is with the hope of aiding in this study that the following suggestions are made. The difficulty of laying down definite rules of practice in this particular is enhanced by the varying conditions which are presented to the operator in his daily work. These conditions must be reckoned with, and it is often a matter of nice judgment to decide what material shall be used; as Dr. F. W. Gethro has succinctly remarked, “There is no best filling material except for the case in hand.” And yet there are certain physical properties possessed by one material which are absent in another, and which may prove a prominent factor in determining its availability or unfitness for certain classes of cavities, and it is with this idea in mind that the present paper is presented.

CAVITIES IN THE PROXIMAL SURFACES OF INCISORS AND CUSPIDS.

These are the cavities which of all others present the most difficult problem for the dentist to solve. It is not that they are more complicated than some others as far as saving the teeth is concerned. This can be done perfectly with gold foil or, in some instances where the incisal angle is gone, with gold inlays. But in most mouths the teeth are exposed to view in conversation, and the display of gold is objectionable. No matter how much we may assert that the prime object of filling teeth is to stop caries and save the teeth, the esthetic taste of our modern civilization forces upon us another consideration, which we, as a cultured profession, should foster and not combat—*i.e.*, the offence imposed upon our higher sensibilities by a display of our dental operations to the eyes of the world. All evidence of our operative interference should therefore be as completely disguised from public view as our ingenuity can enable us to do this, and in this view of the case gold is often contraindicated on account of its color and lack of translucency. It is undeniable that gold is conspicuous in many mouths in anterior teeth, and if we are to live up to the highest possibilities of esthetic dentistry, we must discard it in these cases. But let it be said in passing that in every instance where gold can be used without being exposed to view it should be employed as the most certain means at our command for the saving of teeth.

When gold cannot be used, our choice necessarily falls chiefly upon two materials. Gutta-percha is sometimes suggested, but its field is so limited, except for temporary work, that it need not be considered in the present discussion. Our attention, then, must be directed to porcelain and the silicate cements. The fact may as well be recognized and faced at once that neither material will guarantee the same degree of permanence as gold. I am almost tempted to say that both porcelain and the silicate are merely temporary makeshifts, and yet this would seem to be a rather hard term to apply to materials which have shown instances of good service for many years, and which give promise of as many years to come. But these instances are not sufficiently numerous to entitle these materials to the reputation of being reliably permanent. Of the two, there can be no question that porcelain will last longer than will the silicates in their present stage of development, though it is

confidently hoped that the latter will be improved so as to eventually be much more serviceable than they are to-day. Then they will be preferable to porcelain in one important particular. The margins of porcelain inlays after some years of service are frequently found to be in a very unsatisfactory condition owing to a chipping of the material, or to a staining of the line between the inlay and the tooth. Either of these defects leaves the inlay unsightly. So far as appearance is concerned, the silicates are a distinct improvement over porcelain, and even with their present limitations there are many indications for their use. But they are not sufficiently strong to be relied on for contour work or for fillings in any position where stress is to be applied upon them.

Looking at these two materials with their present physical manifestation, we may follow the general rule that, wherever they are called for, the smaller the cavity the greater the indication for silicate, and the larger the greater the indication for porcelain. We all know the extreme difficulty of obtaining perfect technical results in very small cavities with porcelain, while the lessened area for a wearing surface would minimize the danger of abrasion of silicate cement. In large cavities this exposure to wear becomes a serious menace to the life of silicate fillings, while, aside from its friability, porcelain has perfect wearing properties. In contour restorations, where the incisal angle is gone, the silicates have proved very unsatisfactory, while with porcelain these angles have been restored with an encouraging record of service apart from the conditions of the margins already alluded to. At best, we have no material which perfectly meets these cases, and every observing practitioner must look forward with anticipation to an improvement in this respect. The only thing we can do to-day is to limp along with the materials we have at our command, which is not a very flattering commentary on our prestige as a profession.

A somewhat encouraging solution of this problem may be secured in some instances by a combination of the gold inlay with the silicate cements. When the incisal angle has been destroyed a gold inlay may be made, but before casting this inlay the labial surface is carved in wax to leave a cavity which, after the inlay is cemented, may be filled with silicate cement of the proper shade. Thus the gold is placed where it will receive the stress, and the silicate where it is exposed to view. This will serve a good purpose in certain

cases, but it will not meet all exigencies, and leaves us yet with the necessity of a new filling material for anterior teeth.

CAVITIES IN THE GINGIVAL THIRD OF THE LABIAL SURFACES OF INCISORS AND CUSPIDS.

This class of cases is much more readily controlled. In many instances these cavities are out of view, even when the incisal tips of the teeth are exposed, and in every such case gold, either in the form of foil or of inlays, is clearly indicated. There is no longer any possibility of argument against the fact that gold is the most permanent filling we can use in these cases. A careful observation extending over many years has proved this beyond a shadow of doubt, and no amount of argument can disprove what has so clearly been demonstrated by experience. As to choice between gold foil and gold inlays, this must be determined solely on the basis of technique. If a perfect technique can be obtained with gold foil, this is the filling *par excellence* to use. Nothing in all the alchemy of nature has yet been found which will so perfectly protect a tooth against further decay as a pure gold foil filling when it can be made technically perfect. But this cannot always be done in these cavities without too great discomfort to the patient, and when such is the case gold inlays should be used. This is particularly true if the cavity extends far under the free margin of the gum, and the application of the rubber dam would not only prove painful but might result in such injury as to cause a subsequent recession of the gum. Generally speaking, the smaller or narrower the cavity, the greater the indication for gold foil, and *vice versa*.

When these cavities are exposed to view, the choice must be, as with exposed proximal cavities, between porcelain and the silicates, and the selection should be governed by the same general considerations as have already been mentioned. Probably the silicates have a wider range of usefulness here than elsewhere on account of the better appearance of their margins in these prominently exposed surfaces, but in passing a word of caution must be said with reference to cavity preparation. The sensitiveness of these teeth at this point, and the fact that little stress is to be brought to bear on the filling, tempts operators too frequently to make shallow cavities with little or no mechanical retention. This is particularly true if inlays or silicate cements are to be used, and as a consequence many of these

inlays and fillings have been lost through no intrinsic fault of the material itself. Good mechanical anchorage should be provided not only for inlays, but for silicate fillings, one of the chief limitations of the latter materials being that they do not cling so tenaciously to the dentine or enamel as do the oxyphosphates.

CAVITIES INVOLVING THE INCISAL EDGE OF INCISORS AND CUSPIDS.

If these cavities are situated merely lingually of the labial plate of enamel, and do not involve that plate, they are best protected with gold foil or platinum-gold, but if the entire incisal end of the tooth is involved, so that the labial plate must be lengthened and the filling exposed to view and to attrition, gold or porcelain inlays are indicated. With gold the esthetic feature is sacrificed, and with porcelain there is never any assurance of long-continued service, though it is true that when the stress of attrition is brought to bear squarely against the inlay, porcelain has been known to last a long time. Were it not for appearance and for the long-drawn-out nature of the operation, the very best material for these incisal restorations is platinum-gold. No other kind of protection can be given such teeth which will so serviceably answer the purpose as this material, but its color and exacting technique limit its use.

CAVITIES INVOLVING THE PROXIMAL AND OCCLUSAL SURFACES OF BICUSPIDS AND MOLARS.

It is in the management of these cases that probably the greatest change has been made in the last ten years. Previously thereto the majority of these cavities were filled with gold foil or amalgam, but since the advent of the inlay, particularly the cast gold inlay, a very general stampede has ensued toward that method. The discussion as to the relative merits of gold foil or inlays in these cases seems to have nearly subsided, and as a matter of fact it might as well subside entirely, because in the face of all our discussions over this matter, our patients have taken the decision largely into their own hands, and have aligned themselves almost as a solid phalanx on the side of the inlay. We may indulge in long and learned discussions as to the virtue of gold foil, but when it comes to undergoing the discomforts of the rubber dam and having a large gold foil filling in a bicuspid or molar malleated, trimmed, and polished in the mouth, the entire operation requiring an hour or an hour and a half, and comparing this kind of a session with the

relative ease of having an inlay inserted, there is no kind of argument that will impress the patient sufficiently to gain his consent to have a gold foil filling inserted. We may as well face the situation as it is, particularly in view of the fact that gold inlays, when well inserted in these cavities, give promise of most excellent service. It is safe to say that since inlays have been used so extensively the interproximal spaces and contact points are preserved in a more normal condition than when foil fillings were inserted in these same cavities, and this of itself is a very important consideration.

The use of amalgam may also be said to have declined since the advent of the inlay, and this is a distinct gain—not that amalgam should be looked upon as an inferior material, but because there can be no question that the use of gold inlays tends to produce a higher class of service than the use of amalgam. Never in the realm of dentistry has a more radical change been made than by the general introduction of the gold inlay into practice, and this change will mean much for the future preservation of the natural teeth if the profession does its full duty by the inlay.

CAVITIES IN THE OCCLUSAL SURFACES OF BICUSPIDS AND MOLARS.

These cavities are usually started in the pits and fissures left by developmental defects in the teeth. They are not the same class of cavities as those which form in smooth surfaces where the enamel is good, and their management is somewhat different. If gold inlays are largely indicated over gold foil for proximo-occlusal surfaces, the converse is true of simple cavities in occlusal surfaces. In these cases, gold foil will serve a much better purpose than inlays, and the exactions in inserting it are not so great as with proximo-occlusal fillings. In fact many of these occlusal fillings may be inserted without the rubber dam, and the aggregate of time employed is much less than that necessitated in the construction of an inlay. Moreover, as has been previously remarked, there is no other protection for a cavity so perfectly reliable as gold foil when properly inserted, and in these instances it is possible to get a perfect technique with little tax on the operator or patient. In cases where caries has merely followed the fissures or is located only in the pits, it is useless to cut away sound tissue to widen the cavities sufficiently to make inlays practicable. Inlays do not lend themselves readily to small or narrow cavities, and the operation is less exacting and the results are more certain

with foil in such cases. In fact, in many instances a good foil filling may be inserted in the length of time required for finishing the wax model of an inlay, and this is particularly true of deep and narrow cavities following fissures, which can very quickly and serviceably be filled with non-cohesive foil, sealing the cavity so as to protect it perfectly against recurring decay. In cavities presenting any appreciable area to the attrition of mastication, the non-cohesive gold should be covered with cohesive to provide a better wearing surface, and in some very extensive occlusal cavities, where much tissue has been lost and when the patient is so difficult to control as to jeopard the probability of a perfect foil filling, the insertion of a gold inlay may be found more serviceable.

In some of the small pit cavities in young patients, a combination of tin and gold will serve an excellent purpose, and this material can be inserted more rapidly than gold alone. In fact, after its manipulation is mastered, it may be inserted in these cases more easily than amalgam, and its length of service is greater, many of these fillings having been under observation for fifteen or twenty years.

CAVITIES IN THE GINGIVAL THIRD OF THE BUCCAL OR LINGUAL SURFACES OF BICUSPIDS AND MOLARS.

In these cases, the judicious use of gold inlays or amalgam is clearly indicated. The difficulties of keeping such cavities dry, especially when they extend under the gum, as many of them do, are so great, and the application of the dam is so painful, that the inlay method is usually preferable to gold foil. In cases where economy is paramount amalgam may be used, but the margins of amalgam fillings in this class of cavity are seldom satisfactory after a few years of service, and inlays should be inserted wherever possible.

PIT CAVITIES IN THE LINGUAL SURFACES OF INCISORS AND IN THE OCCLUSAL THIRD OF THE BUCCAL SURFACES OF MOLARS.

Here is a condition where the teaching may be definite and dogmatic. There is really only one kind of filling material indicated for these cases, and that is gold foil, usually in an unannealed form. The nature of the decay, the manner of its progress, and the position on the teeth, all combine to indicate foil and to contra-indicate inlays, while the ease with which foil may be inserted renders it foolish to attempt inlays. A cavity of this kind once properly prepared and .

filled with foil may be looked upon as about the most permanent operation that can be performed in the human teeth, and it is usually neither difficult nor painful.

CONCLUSION.

The foregoing consideration of the indications for the various filling materials has been guided by the thought that the aim of the profession should be in the direction of preventing cavities instead of filling them; but the essayist's conviction is strong that it will yet be many years before prevention becomes an established fact, and in the meantime the best service we can give our patients is to arrest caries as it arises, by filling the cavities. In doing this, it is well for us to study carefully the indications for the use of the materials at our command, so that we may employ them to the best advantage and for the welfare of those whom we serve.—*The Dental Cosmos.*

On the Probable Causes of Missing Teeth.

By DR. VICHOT.

CHE causes of missing teeth are numerous and one cannot mention any single cause, even for upper lateral incisors, such as tuberculosis, as Dr. Therre would have us believe. In one of his cases it is certain that the absence of two laterals in three children born after tuberculous pleurisy of the mother makes one think of tuberculosis when the four children born before this attack did not present the abnormality. He quotes two other cases, but one cannot build a general theory on the observations of three cases. In our own statistics based on twenty-two cases, not one of tuberculosis or pre-tuberculosis was found and each patient was carefully examined from the hereditary and personal points of view.

The disappearance of a lateral is common and there are numerous cases of this abnormality in families entirely free from tuberculosis, and, again, in many tuberculous families this regression is not found.

How can one explain by tuberculosis the disappearance of the third molar in certain families and races? In the Romagnol race the absence of wisdom teeth is the rule. The

progressive march of this regressive evolution is quite clear when it is established in certain families over several generations; for example, in those cases where there are almost normal third molars in one generation and in the following one atrophied or dwarf teeth and finally total agression in the third generation. Now how can one admit that the third molar is disappearing as a result of regressive evolution and that the tooth which is next most frequently absent, the upper lateral, is disappearing solely as a result of tuberculosis?

We notice that variations in number of the teeth are more frequent in the white than in the colored races, and in the higher rather than in the lower races. It is therefore evident that regressive evolution of the dental system obeys laws governing progressive evolution of species and, in particular, of heredity.

Bolk says that three of our teeth, the upper lateral, the second premolar and the third molar are of the regressive nature. This variation is of a progressive nature; that is to say, has a tendency to a dentition of a special type.

Since quaternary man, jaws are becoming less prominent and the brain case is increasing in size and is seen in races occupying different positions as regards their degree of civilization. Statistics give 19 per cent. of cases of absence of the third molar in the lower races and 42 per cent. in the higher races. These figures clearly show the regressive character of the evolution of this tooth.

In the purely animal kingdom regression is also seen, and we cannot regard tuberculosis as the cause of it. The causes of this regression may be divided into

- (1) The mode of life (rodents and ruminants).
- (2) Domesticity (the pig compared with the wild boar).
- (3) The degradation of the race (hairless dogs).

In man the relation of the dental system with the hairy system has been examined, and also its relation with the mode of life. Cases have been reported in which hereditary cavities is accompanied by total or partial loss of teeth. This relation is not constant. Magitot quotes two cases of dental regression corresponding to an exaggerated development of the hairy system.

As regards the mode of life, it has, in our opinion, both on men and animals, an influence on dental regression. It is seen that the development of civilization in men is in

relation with the diminution in size, first of the jaws and later of the teeth. This is the result of the loss of some of their primitive functions. Mastication is easier and more quickly performed. As a result of this adaptation to function teeth tend to regress as regards their size and sometimes as regards number.

Regression is due to the atrophy of certain of the dental buds from the primitive tooth band. The causes may be summarized thus :

(1) PRIMARY FACTORS.

- (a) *Compression.*
- (b) *Pathological troubles.*
- (c) *Influence of the secretion of the ductless glands.*

(2) SECONDARY FACTORS.

HEREDITY BEING THE MOST IMPORTANT.

(1) PRIMARY FACTORS. (a) *Compression.* Regressive evolution of the face is very clear from prehistoric man to modern man; the jaws of the former are large and prominent; these characters diminish as he becomes raised to the higher races. The jaws have therefore regressed and with them the size and number of certain teeth in direct ratio to the degree of civilization. Some consider the civilized races hereditarily present jaws which are too small, but Rattemeyer thinks that the teeth have changed less quickly than their surroundings. We have thus inherited the teeth of our ancestors and the jaws of our parents. Greater irregularity in the position of the germs of the permanent teeth at the period of eruption of the second dentition is well known. This is only seen in civilized races; in savage races there is absolute regularity.

Being given an embryonic element and an obstacle placed in the way of its development, such as constant pressure on a dental germ, its growth will undergo a period of arrest; this may result in partial or total absorption. This compression will act on either dentition according to the embryological period at which the phenomenon occurs; supposing the obstacle is removed before there has been complete degeneration, the development of the organ may recommence, leaving traces of the arrested development.

From the preceding it will be seen that pseudo-regression is produced by want of room, due to arrested development of the jaws. This arrest of development brings about compression of the dental germs and very often of persistence of the deciduous teeth. These teeth may remain in

place for many years. The lower third molar being the tooth which most often suffers from want of room is subject more than any other to the influence of compression. Situated between the ascending ramus of the mandible and the second molar, the follicle of this tooth, as a result of regressive evolution of the jaws, is more and more compressed and finally atrophies and disappears by total resorption.

(b) *Pathological troubles.* Atrophy is an arrest of local development due to an abatement of nutrition. Pathological causes may be traumatic, as fractures of the jaws; may be constitutional, such as rickets, alcoholism, tuberculosis; may be destructive, as inflammatory processes of the jaws, and finally may be degenerative processes in the follicles of the teeth. Tumours, such as sarcoma, may completely destroy the dentition by displacement, and cause the permanent follicles to disappear.

Kjaer quotes a case of total absence of permanent teeth in a person twenty-six years of age, whose parents were neither syphilitic nor tuberculous. This total regression must, therefore, be due to some trouble of intra-uterine life, for there was no hereditary cause. Black attributes atrophy to a disease depriving the teeth of nutrition during the process of growth; others attribute it to hereditary syphilis, and Magitot to eclampsia.

There are causes of denutrition of the mother of the foetus or of the child at the beginning of life, which produces congenital absence of teeth. All infectious diseases may be mentioned, with typhoid fever as an example; in one of our cases there was regression of one upper lateral incisor in a very healthy patient, and in whose parents no cause could be traced, and who had had a serious attack of typhoid at four years of age.

During the period of formation of the dental follicles every affection will echo on the system, and lead to troubles of nutrition, which are so many causes of non-formation or resorption of these follicles.

Vascular abnormalities may also cause certain abnormalities which may be explained by congenital modification of the blood supply to the bones. We may therefore believe that in some cases dental regression is due to a bony abnormality of arterial cause; for example, delay in the union of the superior maxillary processes during intra-uterine life.

(c) *Influence of the secretion of the ductless glands.* Cases of individuals with an insufficiency or absence of cer-

tain ductless glands, the thyroid in particular, are well known. These conditions produce myxoedema, characterized by arrest of the general development of the entire organism, so that the individual is short in stature and infantile in appearance and intelligence, and the hairy system almost nil.

The dental system shares in this arrested development and numerous teeth may never appear. Under the influence of thyroid treatment these teeth may erupt. These are cases of pseudo-regression, for the teeth were probably formed, but had not completely developed (L. Levi and H. Rothschild).

2. SECONDARY FACTORS. *Heredity.* Primary factors create variations; heredity seems to fix them. The data at our disposal does not suffice for us to find the primordial cause of hereditary regressions.

According to some observers the absence of certain teeth may become a transmissible character for several generations. This heredity of dental regression may appear at the same time as certain anatomical peculiarities or malformation of an organ, such as myopia and astigmatism. Heredity may be pathological; that is to say, the abnormality may be the result of infection or intoxication of the parents by tubercle, alcoholism or syphilis, which represent the primary factors of variations.

We therefore do not admit that the absence of teeth is always of syphilitic origin. Tuberclse and alcohol may bring about in the descendants a degeneration of the organisms, consequently they may at times be given as causes of regression.

Our conclusions are: (1) That dental regression appears to be in relation with the degree of civilization in the different races of mankind. (2) That the different pathological troubles lead to denutrition of the foetus and child at the beginning of life and are important and frequent causes of regression. (3) That it seems to be the result of the effect of various factors, such as compression and pathological trouble.

Finally, this abnormality manifestly becomes hereditary and tends to bring about a special type of dentition in certain families.—*La Province Dentaire.*

Dental Clinics for School Children.

A DEFINITE PROGRAM FOR NEW YORK CITY IN 1915.

BY EDWARD F. BROWN,

Superintendent, Bureau of Welfare of School Children, New York Association for Improving the Condition of the Poor.

I. INTRODUCTION AND SUMMARY.

CHE intelligent interest awakened in the oral hygiene movement is amply manifested in the benevolent donation of Mrs. Elizabeth Milbank Anderson, who in providing for a Bureau¹ of Welfare of School Children in the Association² for Improving the Condition of the Poor, laid upon us the wise injunction to "attempt to increase the clinic facilities for the treatment of the physical defects of children, and particularly dental clinics, as it seems to be widely recognized that the school children not only suffer very generally from defective teeth, but also that many of their ailments are due to that cause."

Following the astute advice of its founder, the Bureau immediately after its inception made a survey of the field in New York City to ascertain what the conditions were and what steps were desirable to meet the situation. Part of this preliminary effort was a study of the dental clinics maintained by the Bureau of Child Hygiene of the Health Department for the treatment of necessitous school children. Briefly stated, this study determined two cardinal points, namely:

1. That the Health Department had made a commend-

¹Bureau of Welfare of School Children: Willard D. Straight, chairman; Leonard P. Ayres, Leonard E. Opdycke, Chas. C. Burlingham, Owen R. Lovejoy, Philip Van Ingen, M.D., Thos. D. Wood, M.D., Miss Mabel H. Kittredge, the Author.

²A. I. C. P. officers: Cornelius N. Bliss, president; Robt. Shaw Minturn, treasurer; Franklin B. Kirkbride, secretary; George W. Wickersham, counsel; Bailey B. Burritt, general director.

able beginning in the establishment of school children's dental clinics.

2. That there was urgent need for an extension of this work, after a carefully considered plan, in the interest of public health.

The Bureau, seeking to aid in a satisfactory solution of the problem, undertook the task of making a comprehensive plan for the establishment of clinics similar to those already in existence, apportioning the same in centrally located districts in which the need for such service was patent. The plan called for an ideal situation. Realizing that any profound change, to be enduring, must be slow and studied, the Bureau deemed it proper to divide the plan into a series of steps, each to be successively taken after careful consideration in a period of years. The first stage of our journey on the way to an effective and economic solution of the problem of caring for the teeth of school children is presented herewith as the program which we believe the city ought to make provision for in its budget for 1915. The plan and program have been developed largely in consultation with a special committee³ of the First District Dental Society appointed for the purpose, under the inspiring initiative of Dr. Herbert L. Wheeler, its chairman. There were later added to this group other leading dentists, all of whom have generously aided in the formation and development of this plan.

1. *Dental Decay Among School Children.*—In 1913 the medical inspection of the Health Department found 194,207 cases of dental defects among school children. Owing to inadequate funds having been provided for this signally important work, the staff of medical inspectors is so limited that only 37.3 per cent. of the school enrollment were examined. If we assume the same ratio of defects in the unexamined 63.7 per cent. of the school population, there are apparently 524,359 cases of dental defects—major and minor—in the city schools, all, however, in need of immediate dental attention. This figure represents 59 per cent. of the school enrollment in need of such care. Without east-

³Dr. Arthur H. Merritt, Dr. Warrington Lewis, Dr. Horace Gould, Dr. Charles C. Linton, Dr. C. Denny Kimball, Dr. Donald B. Armstrong, Dr. William C. Deane, Dr. Matthew Carney, Dr. H. Spitz, Mr. Bailey B. Burritt, the Author. This list includes some dentists and laymen other than those of the official committee.

ing any aspersions on the work of the medical examiner, it is not unfair to say that even this is an underestimate, because the examinations were necessarily hurried, not made by dentists, nor with the aid of a probe.

Of the 69.7 per cent. of the children found in need of medical aid, only 23.8 per cent. are reported treated for the defects discovered. A large number of the dental cases, estimated for the Borough of Manhattan alone at 81,512 children, are probably too poor to go to a private dentist. It is particularly to this group that we are to give attention.

2. The Economy of Municipal Care.—The unattended cases of dental defects and disease seriously affect the physical condition of the child, rendering it susceptible to other diseases through the general devitalization of the body. The community suffers in so far as it must harbor and ultimately in many cases must maintain dependents who may have been rendered unproductive because of the neglect of the oral cavity and the serious consequences which flow from such negligence. Educationally, the child is handicapped in not being in a physically fit condition to benefit by instruction. Economically, through the absences from school due to aching teeth, the child is frequently retarded in grades and the city must spend large sums of money in re-educating such children. Thus is the need apparent.

II. THE PRESENT STATUS OF DENTAL CLINICS.

The school children's dental clinics maintained by the Department of Health were made possible by an appropriation allowed in 1913 by the city, so that the work of caring for the teeth of school children whose parents were unable to pay for proper dental treatment might be adequately attended. The Bureau of Child Hygiene, under the enlightened administration of Dr. S. Josephine Baker, recognized the need, as a result of which six clinics were organized, with Dr. Matthew Carnew as supervising dentist. The clinics were apportioned as follows: Manhattan 2, The Bronx 1, Brooklyn 3.

The following is the semi-annual report of the work performed in the Children's Dental Clinics of the Department of Health, for the period from January 1, 1914, up to July 1, 1914:

Number of patients	3,970
Number discharged	3,315
Normal	0
Cured	2,894

Dropped	461
Number of treatments	28,239
Number of temporary fillings	1,196
Number of operations	21,384
Deciduous extractions	7,802
Permanent extractions	405
Permanent fillings	10,644
Cleanings	2,092
Other	441

III. THE PRESENT SITUATION AND THE NEXT STEP.

There are six dental clinics now maintained by the Bureau of Child Hygiene where children whose parents are too poor to pay for private treatment have their teeth repaired.

These clinics are apportioned as follows: Manhattan 2, The Bronx 1, Brooklyn 3; no provision whatever is made for Richmond or Queens.

There are nine dentists, receiving \$1,200 per annum, who work three hours a day, usually in the afternoon from two to five. There is one supervising dentist, receiving \$1,500 per annum. The clinics are open during the school vacation also. The clinics are located outside school buildings, and considerable difficulty is sometimes experienced in having the children go from their class work outside the school building for treatment.

The table given below shows the present apportionment of clinics and the next column indicates the contemplated distribution of the nine additional clinics for which funds are asked from the municipal authorities for 1915:

Boroughs.	Present number of clinics.	Number asked for,
Manhattan	2	3
Bronx	1	2
Brooklyn	3	2
Richmond	0	1
Queens	0	1

— 6 (9 dentists) 9 (9 dentists) —

At the present time there are nine dentists employed in the six existing clinics and an equal number of nurses.

We ask for nine additional dentists and nurses.

If the nine additional clinics are established, there will be fifteen dental clinics for the free treatment of school children for the whole city of New York.

Six of these will be located outside school buildings and nine in school buildings.

IV. THE SCOPE OF THE DENTAL CLINIC.

At the invitation of the Bureau of Welfare of School Children, a council was called, consisted of the special committee of the F. D. D. S., other leading dentists and the executive officers of the Bureau. To this council the author had submitted twelve fundamental propositions relating to the proposed plan of clinical extension. The absence of any material difference of opinion on the general propositions indicated the careful thought which had been given to the questionnaire which was sent to each member of the conference some time before the meeting. The pith of the principles laid down by this group of New York's leading dentists follows:

1. That it will support the modest request for nine additional dental clinics as outlined in the proposal of the Bureau.
2. That the dental clinics be established in school buildings.
3. That the clinics be open from 9 to 5, with two shifts of dentists, each working half time.
4. That the supervising dentist, for adequate compensation, devote his entire time to the work.
5. That the clinics should extract, provide plastic fillings, and clean teeth only.
6. That the Bellevue equipment be utilized for the surgical work.
7. That the dentists be paid \$1,200 a year for half-time work.
8. That a system be devised whereby the work of the dentists be checked up to insure efficient treatment of each school child.
9. That the clinic concentrate its work on the children between six and eight years of age.
10. That the treatments be absolutely free.
11. That, while the two-chair clinic has advantages over the single-chair clinic, for the present it is wise to organize nine additional single-chair clinics and subsequently, if it be deemed wise, equip these nine stations with additional chairs.
12. That the school clinic provide tooth-brushes, mouth and tooth preparations at cost to school children.

V. THE COST.

The actual money cost in taking the first step in the admirable program of the Health Department will approximate \$18,900 for the first year for professional service alone. Adding equipment and supplies, the total cost will in all probability not exceed \$27,000.

No progressive dentist, having at heart the highest ideals of his calling, can afford to neglect to take an aggressive attitude in support of such a program.

With 524,359 cases of dental defects among school children alone, the duty of the dental profession is clear. Two phases of prime importance command attention—namely, prevention through education; and cure.

The prophylactic dental movement is, fortunately, not confined to the prevention of the defects and diseases of the oral cavity, but, on the contrary, is a wise measure in the promotion of public health generally. There is no greater or nobler service to which the dental profession can dedicate itself.

The impetus which will come as a result of the establishment of the dental clinics proposed will serve to emphasize to the adult public the need of conserving the teeth—all of which will ultimately inure to the benefit, not alone of society as a whole, but to the dental profession in particular.

VI. THE EFFECT OF DENTAL IMPAIRMENT.

1. *Physical*

If dental defects resulted in a purely local abnormality the general apathy of the public might be condoned. The serious character of the ailments which are a proximate cause of dental neglect cannot be over-emphasized. Some of these results may be here summarized. Unsound teeth are inefficient servants in the task which nature intended them for—the cutting and grinding of food. The poisonous incubation of pathogenic bacteria in the recesses of decaying molars exposes the food to contamination, frequently poisoning the same, and in such an impure state it goes to the stomach. The lack of proper mastication of food results frequently in indigestion and other troubles of the stomach. Malnutrition is sometimes the result of the inability to secure the maximum nutrition of the food owing to its being rendered unfit and unassimilable, or, more often, not rendered fit by reason of imperfect teeth. A malnourished body is a magnet for disease. The power of resistance is at

low ebb. It is not difficult for disease to gain a foothold and overcome the victim. Frequently facial neuralgias are the direct result of unsound teeth. It is believed also that the tooth socket infection in *pvorrhea alveolaris* is responsible for many disabling, general, systemic disturbances, described symptomatically as rheumatism.

Dr. Petruschky-Danzig says: "Decayed teeth offer during childhood the chief passageway for the tuberculous bacillus; thence arise the so-called scrofulous lymph ducts on the neck. Ninety per cent. of the Berlin and eighty-five per cent. of the Danzig school children have been found affected by these swellings. The imminent danger of decaying teeth in early childhood is clearly shown from this."

2. Social.

It is trite, yet nevertheless sound, to say that all that seeks to improve the physical condition of children contributes to the general health of the community. If it is possible to render a dull pupil efficient through improving its physical condition, it would make it unnecessary to provide funds for the re-education of such children. A child who is a good student is likely to continue in school and go on to a higher education much more readily than the child who, disappointed and in despair, leaves school owing to a bad scholarship record, the only cause of which may be some physical discomfiture, defect or disease. The inefficiency which results from leaving school early in life frequently sends into the large army of intermittent, unskilled workers children who, when they grow up, are without a trade and for whom society frequently must make provision in free clinics, hospitals and almshouses, and not infrequently in prisons.

If the scrupulous care of the physique of the child will render unnecessary these conditions, or tend in any way to minimize the acuteness of the situations which rise from them, then it is sound public economy to make some provision for these children.

3. Educational.

The discouragement, anxiety and inefficiency which comes to the school child directly and frequently indirectly as a result of some such physical impediment as defective teeth, it is impossible to tabulate or tell. It often takes the form of dissuading the child from higher studies. Saddened and with a profound lack of confidence, the child leaves school—all of which may be a turning point in its career,

meaning success or failure in life. The extreme effort the child invests in study is wasted because of its imperfect physical equipment for the task.

VII. DENTAL DEFECTS AND SCHOOL ADMINISTRATION.

The predominant cause of retardation in school can be traced to absences of pupils which affect their school progress. These absences are caused largely by physical inability to attend classes without serious discomfiture and pain. We can all recall the days, no doubt, when with cheeks swathed in bandages we sat dejectedly nursing an indescribable toothache. These absences are more frequent from diseased oral cavities than from any other cause. And in the proportion that we stayed away from school we were losing our lessons and checking our advancement.

VIII. ECONOMIC LOSS TO EDUCATIONAL SYSTEM.

In the year 1913, 189,840 New York City children failed of promotion. The cost of re-educating this group for one term, based on \$19.36 as the semi-annual per capita, equals \$3,675,302.40. It is impossible to determine with any degree of accuracy how much of this is chargeable to physical defects—dental disease being the most common of them all. It is undoubtedly true that much of this sum probably could be saved by keeping the children in good physical trim. Non-promotion is largely caused by loss due to absences because of illness. Toothache which makes it impossible for the child to attend school and learn, malnutrition which is frequently the result of defective teeth, render the child incapable of efficiency as a student. If it is possible at all to minimize the number of children who are retarded owing to the condition of their mouths or other physical disorder, we shall be in a position to save the city a large sum of money now spent on re-education of backward pupils.

IX. CERTAIN ASPECTS OF THE DENTAL CLINIC.

Three phases of the dental scheme might be considered here: 1, Physical; 2, Professional; 3, Educational.

1. *The Physical.*

In order that the dental scheme may be carried out with the least friction, with a minimum of lost movements and maximum results, it should, we believe, be located in the school building proper. If we organize dental clinics for school children, it is but logical that they should be located where the school children are to be found. The adequate control by the educational authorities over the school child

during school hours would make friction improbable. It would be necessary merely to send the child from the classroom to another room in the school building for dental treatment.

This location—by no means new or untried—forms part of that worthy movement which seeks the widest possible use of the school plant. By locating the clinic in the school building, such costs as janitorial and orderly service, light, heat, rent and other fixed charges are merged with the costs of the educational system and would be found to be small compared to what they would be if separate buildings, equipment and service were to be maintained outside.

2. Professional.

The clinic should be in charge of a capable dentist adequately paid, who should be required to devote, for the present, half his time to this work. He should be chosen not merely for his technical skill but with due regard to his capacity to handle children.

A dental nurse should be present to relieve the dentist of the collateral work of sterilizing instruments; to prepare children; arrange appointments; follow up cases; keep records and instruct children generally in oral hygiene.

A supervising dentist in charge of all clinics should preserve the records of work done, supervise clinical research, standardize and unify methods of treatment, keep abreast of all advances in dental hygiene, in order that any new step duly recognized which would tend to benefit the child be taken advantage of.

A registrar, who ought to be a statistician, should be in charge of all the record keeping and should tabulate, analyze and interpret the actual work performed by the clinic.

3. Educational.

The clinic should serve as a centre for the dissemination of all intelligence on oral hygiene.

Consultation hours should be held when mothers with children of pre-school age may come for advice on the cleansing of the teeth of infants. This is justifiable from the standpoint of the clinics being under the jurisdiction of the Bureau of Child Hygiene.

It should be possible for parents to procure at this station prescriptions for mouth washes and tooth cleansing preparations.

Leaflets in the language of the predominating race of the

district where the clinic is organized should be distributed on all matters relating to oral hygiene.

X. THE SOCIAL SIGNIFICANCE OF THIS MOVEMENT.

Dr. William R. Woodbury, neurologist in the Boston Dispensary, in an article reprinted from the *Boston Medical and Surgical Journal* of July 1, 1909, thus tersely analyzes the social value of the oral hygiene movement:

“A community can make no better use of its taxpayers’ money than to afford them the protection which health inspection of school children gives. The care of the child is the conspicuous subject of the year. The care of the teeth is an important factor in the care of the child. Soon, school health inspection will be the rule in every city and town. The mental and physical efficiency of school children can be greatly augmented by the proper care of the mouth and teeth. This is fully attested by the experience in Germany —an experience which covers a wide field. Dental infirmaries connected with the schools have been in operation in that country for a sufficient length of time to demonstrate:

“*First.* That the time expended in putting the teeth in order was far less than the time formerly lost from tooth-ache and disability caused by diseased teeth.

“*Second.* That the cost of keeping the teeth in order was more than compensated for by better health and a consequent reduction in hospital expenses.

“*Third.* That the child became physically stronger, secured a higher average in his studies, was easier to control and was apparently happier.

“Diseased teeth are a fruitful cause of disturbances in other parts of the body, and hygiene of the mouth has a direct connection with, as well as a controlling influence over, the health of every individual.”

For each year that we postpone the adoption of a progressive program for the prevention and cure of dental diseases and defects, we are mortgaging the future with a race of degenerates, physical or mental, for whom the future generation will be obliged to provide hospitals and almshouses, sometimes prisons, to protect society against the train of misfortunes which follows in the wake of society’s neglect to maintain a high standard of physical efficiency.

Sydney and Beatrice Webb, in their book on the Prevention of Destitution, tell us of the custom of the Australian

squatter, who annually rounds up his uncounted flocks and herds for an inventory. If it were possible for us here in New York to muster, as in a monster parade, all the children in need of dental treatment, and were these to go by in single file, it would take nearly a month of constant marching, day and night, to review them from a given point.

There is a minimum of physical development under which society must not permit its children to fall.

XI. THE SOCIAL EFFECTS OF PHYSICAL DISABILITY.

Pauperism is an indication of national decay. Sickness, most of which we are advised is preventable, more than any other single agency, augments the army of the destitute. Here we have dental defects among over a half-million school children—all of them exposed to the more serious consequences of such neglect. Only in the proportion that we unstintingly and wisely spend money and effort to revitalize the exhausted energies of these children and redeem them from the realm of potential physical misfits and defectives, may we expect to bequeath to future generations a race of efficient social beings.

If, on the other hand, we are satisfied to permit the neglect to go on unchecked, we will be flooded in our industrial field with children who, dismayed at the struggle of keeping up in school, will leave school in a condition of unpreparedness which will eventuate in working inefficiency. Through this inability to reach the reasonable expectation of industry, the child's progress in labor for hire is inauspiciously launched. The child will drift from place to place, unsatisfied, restless and saddened—little knowing that this unfortunate condition may be merely the result of some physical defect such as unsound teeth or any of their concomitant evils.—*Journal Allied Dental Societies.*

A QUICK METHOD OF ADJUSTING AN INLAY.—A quick and accurate way of adjusting a gold inlay, especially a large compound, is to heat same to a dull red, then cool without dropping in acid. Insert in cavity with slight rocking movement. Any prominent point will make a bright mark on the oxidized gold, showing points to be relieved.—*D. A. Hare, D.D.S., Chicago.*

The Heating of Our Offices.

DO one will question for a moment the bad effects on health of improper ventilation. We emphasize the beneficial effects of open-air treatment of tuberculosis and pneumonia, forgetting that the same fresh air treatment, if as rigidly carried out, would prevent a large proportion of cases of both of these diseases.

In the heating of our homes and offices the three cardinal points are: proper temperature; proper humidity or moisture; and a current of air—in short, the securing of proper climatic conditions.

The normal outdoor air contains from 65 per cent. to 75 per cent. of moisture. Pass this through a hot-air furnace, and by the time it reaches our living or sleeping rooms it will not contain more than 40 to 50 per cent. of moisture. The same is true in houses heated by hot water where no provision is made for supplying moisture. The result is that this dried-out air craves moisture, and will take it up from all surrounding bodies—from our skin, the mucous membrane of our mouths, noses and throats; and is in a large measure responsible for the dry, hacking laryngeal coughs so prevalent in winter. Furthermore, from an economic standpoint, this method of heating without moisture is very extravagant, for very dry air requires a higher temperature to produce the same sensation of warmth and comfort than does an atmosphere with a proper percentage of moisture.

To overcome this dryness, small reservoirs for heating water have been attached to the furnaces; but these are rarely kept full, and even when they are, they are not at all adequate; for instance, air at 25 degrees Fahrenheit (7 degrees of frost), even if saturated with moisture, if heated to 70 degrees, would require the addition of a half pint of water to every 1,000 cubic feet to give it a humidity or moisture of 65 per cent., which is practically normal.

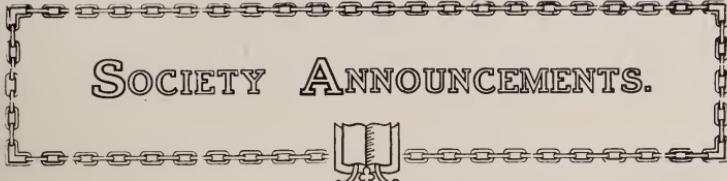
Some conception of the amount of moisture required, and how far the air in our homes, schools and factories falls short of it, can be had from the following description of the precautions taken by the American Bell Telephone Company in their chief building in Boston, which has a capacity of 450,000 cubic feet and a day population of 450 persons.

The fresh air, which is distributed by a mechanical system, is drawn into the building at the rate of 26,000 cubic feet per minute, and has moisture added so as to contain about 50 per cent. of relative humidity. To secure this condition, 675 gallons of water, in the form of steam, are mixed with the air in ten hours, or about one and one-half barrels per hour. Certain parts of the building which had been heated with difficulty before, are now made more comfortable; and in the whole building three degrees less heat is required to maintain a comfortable temperature. There has been a noticeable absence of coughs during the winter among the employees.

Various humidifiers have been suggested, of which a very efficient and simple one is the exposing of the air from a register or radiator to moisture, by having it pass through a surface of cotton wick—one end of which is submerged in a reservoir or vessel containing water, and which is attached to the radiator. It has been demonstrated that by means of this contrivance the relative humidity of a room can be kept between 55 and 6 degrees Fahrenheit by evaporating about 4 1/2 quarts per day; and a temperature of 65 degrees so maintained is as comfortable as one of 70 in a dry atmosphere.

A practical illustration of this is the fact that we can sit and read in comfort on our verandahs in a temperature of from 60 to 65, having a normal humidity; while the same temperature in our homes, with a dry atmosphere, would be very uncomfortable, owing to the more rapid evaporation of moisture from the surface of our bodies in the drier atmosphere.

Obviously, then, whatever the method of heating may be, it is imperative that provision be made for having the air sufficiently charged with moisture.—*Toronto Health Bulletin.*



SOCIETY ANNOUNCEMENTS.

The Ontario Oral Hygiene Committee— Ontario Dental Society.

ON Friday, October 9, 1914, the Executive of the Ontario Oral Hygiene Committee of the Ontario Dental Society held its 45th meeting at the Central Y. M. C. A. Building, 40 College Street, at 6.15 o'clock.

Members present were Drs. McLaughlin, Bothwell and Reade. Dr. W. A. Black was present by invitation to discuss the preparation of a pamphlet to be submitted to the Ontario Government for publication.

The minutes of the last meeting were read and confirmed.

The following correspondence was read:

A letter from Dr. F. E. Bennett, St. Thomas, Ont., stating that the Annual Convention of the Ontario Horticultural Association would be held in Toronto on Wednesday and Thursday, November 11th and 12th, and suggesting that the Ontario Oral Hygiene Convention be held on Tuesday, the 10th.

A letter from Dr. M. G. McElhinney, Ottawa, stating his appreciation of the last Convention of the Ontario Oral Hygiene Convention.

A letter from Dr. J. W. Beach, of Buffalo, who is a member of the Oral Hygiene Committee of that city, accepting the invitation to be present at our Convention in November. He would also like to bring with him other members of the committee to inspect the work done in the Toronto Public Schools.

The following letter was received from Dr. Oliver Martin, Ottawa, Ont.:

“DEAR DOCTOR READE:

“No doubt you will be pleased to learn that while we are not doing very much for the cause of oral hygiene, still things are moving along steadily, and evidently the fates

are with us. For instance, Lt.-Col. J. W. Woods, who supplied the necessary funds for our hospital clinic, showed his appreciation of the faithful attendance which the dentists of Ottawa gave in attending the clinic by entertaining them to a dinner at the Royal Ottawa Golf Club. It was a very sumptuous affair, everything being done on a grand scale. Invitations were issued to a few prominent laymen, among whom were the President of the Bank of Montreal, Mr. Romly, of the E. B. Eddy Co.; Mr. Crearer, a very wealthy gentleman; Mr. Putman, the school inspector, and others. I should say there would probably be between forty and fifty dentists present, including Dr. Morrow of Maxville, who, by the way, is a source of inspiration to us all by his self-sacrificing donation to the cause. He says he felt he could do more by casting in his lot with the Ottawa dentists, and comes to the city regularly to attend the Woods clinic. Speeches were made after dinner on 'The Need of Dental Clinics in the Schools,' and a very favorable impression seemed to have been made on the minds of the lay gentlemen present, one of whom said he regretted that, instead of a few laymen, there were not a hundred present, that they might learn of this important work. The leaven, however, is working, and one after another of prominent and influential people are realizing the crying need for dental services among the poor.

"I suppose, Doctor, you have already heard that the Public School Board have voted an appropriation of one thousand dollars to equip a clinic, but cannot vote money to pay an operator, because it appears such an action would be illegal. Negotiations are now in progress, however, with the necessary legislation, to legalize the spending of money by School Boards in Ontario for this purpose. As it is, I understand, all the school clinics now being operated in Toronto are run illegally, and any crank could step in with an injunction and prevent your School Board from voting money to pay the salaries of the operators in the school clinics.

"Dr. Alex. Armstrong, who is chairman of the Finance Committee of the School Board, deserves credit for the work he has done, and so does Dr. Green, who is one of the School Board; the inspector also, Dr. Putman, is very enthusiastic in providing clinics, and is giving the School Board every encouragement and all the assistance he possibly can.

"With kindest regards, I remain,
"Yours fraternally."

The Executive resolved to hold the Oral Hygiene Convention this year on Tuesday, November 10th. The following is the first draft of the program:

1. Automobiles to be in attendance at the Royal College of Dental Surgeons, College Street, at 10.30 on Tuesday morning, to take the delegates to visit the school clinics.

2. At 2 o'clock in the afternoon arrangements are made to visit the municipal dental clinic, and to inspect the methods of carrying on the work and keeping records.

3. At 3 p.m. the delegates will be taken to visit the museum, where arrangements will be made to have the party personally conducted around the building.

4. A visit will be paid to make a tour of inspection of the Central Y. M. C. A.

5. Dinner will be tendered to the delegates at the Carls-Rite Hotel at 6 o'clock in the evening.

6. After the dinner the following program will be given:

(1) A few remarks by the Chairman, Dr. R. G. McLaughlin, Toronto.

(2) Dr. W. H. Doherty and Dr. J. A. Bothwell will give an illustrated talk on what is being done in Toronto, lantern slides being used for the occasion.

(3) Dr. J. A. Bothwell, Stratford, will be asked to give a paper on "The Plan of the Work to Meet the Difficult Problem of Rural Schools' Dental Inspection and Clinics." A general discussion will then follow, and all those who have met with difficulties can present them to the meeting and have the subject discussed and cleared up as much as possible.

The meeting adjourned at 9.30 p.m.

ROBERT J. READE, *Secretary.*

Toronto Dental Society--Important Announcement.

CHE first meeting of the season will be held at the Carls-Rite Hotel, corner of Front and Simcoe Sts., Toronto, on Monday evening, November 9th, 1914, when Dr. William R. Pond, of Rutland, Vermont, will present a paper and clinic on the subject of "Amalgam." Dr. Pond has read papers before some of the American soci-

ties, and has attracted a great deal of attention on account of the great work he is doing along this line.

The Committee has been particularly fortunate in also securing for this winter Dr. Marcus L. Ward, of Ann Arbor, Michigan, who will give a paper on "Cast Gold Inlays." Dr. Ward's work was the outstanding feature at the big Chicago meeting last spring.

Another essayist already secured is Dr. M. T. Barrett, of Philadelphia, who will discuss the subject of "The Protozoa of the Mouth in Relation to Pyorrhea Alveolaris." Dr. Barrett presented a paper upon some phases of this subject before the Pennsylvania State Dental Society last July, which was published in *Dental Cosmos* of August last.

The Committee is also endeavoring to secure two other prominent men to deal with important subjects, announcement of which will be made later.

The officers of the Society are to be congratulated upon having secured Dr. Marcus L. Ward, of Ann Arbor, for one of the meetings. Dr. Ward will not only discuss the theoretical side of the gold inlay question to the fullest extent, but will cover the application of these principles in the light of our present knowledge. Every phase of the technique of casting will be covered by Dr. Ward.

With such a programme the Toronto Dental Society should this year have the most successful season in its history.

Toronto Oral Hygiene Committee.

CHE Executive Committee of the Toronto Dental Society, at a meeting held on October 16th, appointed the following members their Oral Hygiene Committee for the present year:

..

Drs. Geo. Grieve, R. G. McLaughlin, Wallace Seccombe, W. H. Doherty, A. E. Webster, W. A. Black, H. E. Eaton, A. J. McDonagh, J. A. Bothwell, F. C. Husband, and C. A. Kennedy.



CORRESPONDENCE.



CO THE EDITOR OF ORAL HEALTH, TORONTO, CANADA:

The dental profession of Indiana will have a memorial service in honor of the memory of Dr. George Edwin Hunt, to be held in the auditorium of the Masonic Temple, North and Illinois Streets, Indianapolis, Indiana, on the evening of November 21st, 1914, at 8 o'clock. The principal address will be by Dr. John N. Hurty.

The friends of Dr. Hunt are cordially invited to attend this service.

CARL D. LUCAS,

Chairman of Committee.

CO THE EDITOR OF ORAL HEALTH:

*Dear Sir,—*Until recently the dental profession has not been represented on the foreign mission fields, but many are now awaking to the fact that the oral cavity is one of the main if not *the* main avenue for the entrance of disease germs into the body, and that any adequate attack upon the forces of disease and suffering must include the care of the teeth, and there is a growing feeling that in manning our medical teaching institutions in the mission field we must include provision for teaching the care of the teeth and their treatment when diseased.

The Severance Hospital and Union Medical College, in Seoul, Korea, believes in this, and so has established a dental department, for which it now seeks a competent head, and the object of this note is to bring this opening to the notice of all those who may feel interested in such an undertaking.

This institution is, as its name implies, a union one, being under the joint care of Methodists and Presbyterians and aided, in addition, by the Episcopalians, and is in every sense a modern plant with a good hospital and a thoroughly up-to-date medical school, supplied with well-equipped laboratories. It has graduated 33 physicians—all Christian—

and has now an enrolment of 81. The patients consist mainly of Koreans, but there are also many Americans and Europeans to be treated.

The call is for a man fully qualified professionally, not simply the holder of a diploma, but one who has actual skill in modern methods, coupled with a desire to serve God and humanity through the use of that skill, and having zeal to bring men to believe in God through Jesus Christ.

The superintendent of the plant, Dr. O. R. Avison, is at present in this country and will be glad to meet with or hear from any who may wish to learn more of this place. He is now at 589 Spadina Ave., Toronto. Telephone College 7805.



Dr. and Mrs. J. B. Willmott, Toronto

1864. — September Fifteenth. — 1914.

Congratulations !



PERSONAL PAGE

MEMBERS of the profession will be sorry to learn of the death from pneumonia of the wife of Dr. P. T. Coupland, of St. Mary's.

Dr. J. B. Willmott, Dean of the Royal College of Dental Surgeons of Ontario, has been elected an honorary member of the British Dental Association.

Dr. G. F. Beldon, of Toronto, has announced that it is his intention to specialize in prosthetic dentistry.

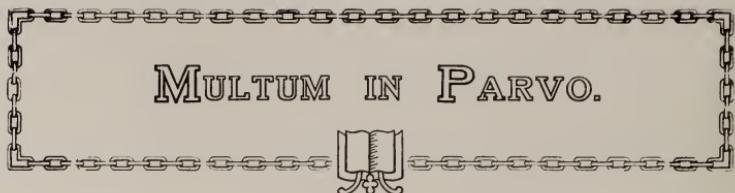
Congratulations are in order in a number of cases where dental bachelors have been reported as having joined the ranks of the benedicts. These are: Dr. M. M. McIntyre, of Windsor; Dr. G. A. Elliott, of Brantford, and Dr. F. N. Sangster, of Sarnia.

It is reported that a number of dentists accompanied the first contingent in the capacity of army dental surgeons. ORAL HEALTH will be glad to receive information as to who these dentists were, that a complete list may be published in the near future.

So far as we are able to learn the following dental surgeons were attached to the Hospital Service of the First Canadian Contingent: No. 1 Stationary Hospital, B. L. Neilly; No. 2 Stationary Hospital, W. Bentley; No. 1 General Hospital, A. G. Hassard; No. 2 General Hospital, F. W. B. Kelly.

Dr. E. A. Higley, formerly of Blenheim, Ont., has commenced practice in Chatham, Ont.

Dr. E. S. Hardie, formerly of Guelph, Ont., has opened an office in Hensall, Ont.



This Department is Edited by C. A. KENNEDY, D.D.S., 2 College St., Toronto

Librarian, Royal College of Dental Surgeons of Ontario

*Helpful Practical Suggestions for publication, sent in by members
of the Profession, will be greatly appreciated by this Department.*

To JOIN TWO RUBBER TUBES OF DIFFERENT SIZES, slip the smaller one into the large one, dampen with collodion, wrap a wisp of cotton saturated with collodion around the joint. The two can be joined in this way gas and air tight, and the joint can be smoothed up to present a perfectly workman-like appearance.—*J. Scott Walker, D.D.S.*

DISPOSING OF EXCESS AMALGAM.—After removing matrix from tooth, filling being amalgam, a piece of rubber dam drawn taut, and then passed between the teeth, and over the margins, is an excellent way to remove excess amalgam and smooth up filling.—*J. H. Pearce, D.D.S., Peoria, Ill.*

A POINT OF IRRITATION.—On the lower jaw absorption occurs until the opening of the mental foramen, between the bicuspid and molar teeth, is directly on top of the jaw, and as the plate is pressing upon this it binds upon the exposed nerve. The patient suffers much, and I apprehend very few dentists are aware of it. When the dentist finds no cause for the trouble on the margins of the plate, press the finger along the middle of the jaw and he will soon find it. Moisten a little whiting on the palm of the hand and with a spatula place a little bit on the white nerve as seen, and replace the plate, removing which the identical location is seen on the plate. Relieve with small carborundum.—*L. P. Haskell, Dental Review.*

ARRESTING HEMORRHAGE FOLLOWING EXTRACTION.—In post-operative bleeding, a tampon of cotton saturated in a five per cent. solution of iodine in chloroform is introduced into the empty alveolus, inducing prompt arrest of the hemorrhage.—*Dental Surgeon.*

MELTING ALUMINUM.—In melting aluminum previous to casting, new, clean ingots should always be used. The metal should never be overheated, and when fusing should be slightly agitated with the end of an ordinary slate-pencil, from time to time, and all dross removed, until a smooth, clean surface presents, after which the casting should be made, observing only moderate speed in doing so, as the metal remains liquid for some moments.—*H. J. Goslee, D.D.S., Chicago, Ill. (Dental Review).*

NO PERMANENT ANTISEPTIC ROOT FILLING.—There is no such a thing as a permanent antiseptic root canal filling. It is only a catch phrase used by the manufacturers of root canal filling material to sell the material. If dentists would learn to fill roots not with this zinc oxid formaldehyde paste, but with some kind of gutta-percha, or some other kind of material that nature would tolerate and keep the bone and tissue in the apical region healthy, we would be doing a great deal.—*J. P. Buckley, D.D.S., Chicago, Ill. (Dental Review).*

ALUMINUM BASE PLATES.—Reasons why swaged aluminum base plates are more susceptible to disintegration than cast base plates: The purest and least contaminated aluminum to be had is not attacked by oral secretions. Chemical action can only attack through impurities embodied in the metal. Aluminum in ingot form, it is reasonable to suppose, is uncontaminated, or the least contaminated. Aluminum rolled plate may, and undoubtedly does, become contaminated. It is rolled in iron, it is swaged between base metal dies while saturated with oil, and impurities are practically driven into the metal's surface, there to be attacked and eaten out.—*R. C. Brophy, D.D.S., Chicago, Ill. (Dental Review).*

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Vol. 4 TORONTO, NOVEMBER, 1914. NO. 11

EDITORIAL.

Hospital Dental Clinics.

TORONTO TAKES ANOTHER STEP IN ADVANCE.

A NEW epoch in the history of the relationship of dental surgery to general hospital practice is marked by the arrangement for the establishment of fully equipped dental clinics in two of Toronto's leading hospitals.

In the past comparatively little attention has been paid to the condition of the mouths of patients in general hospitals, beyond the extraction of teeth. In Toronto attempts have been made from time to time, by the Toronto Oral Hygiene Committee, to have such clinics established. Dr. A. D. A. Mason, who is on the staff of the General Hospital, has also endeavored to have something done along this line. In neither case has any result been obtained.

Credit for the present step belongs to Dr. C. J. O. Hastings, Medical Officer of Health, and to Dr. J. A. Bothwell, a

member of Dr. Hastings' staff, who has been chief of staff of the Municipal Dental Clinic. Dr. Bothwell has made a thorough success of the clinic for children, a fact which has probably influenced the Medical Officer of Health in branching out into the other field.

There are two features of this development that, to the dental profession, are significant. Dr. Bothwell points out, in his article elsewhere in this issue, that the service is first for those patients whose general health is suffering as a result of mouth conditions. This is the first *practical* recognition on the part of our general hospitals of such a relationship. Further, the part time operators are to be paid a salary, a concession which is absolutely necessary, owing to the peculiar nature of both hospital and private dental practice.

Dr. Hastings will receive the united appreciation of the dental profession for his broad-minded attitude on this question. To Dr. Hastings, to Dr. Bothwell, who will be in charge, and to the hospital authorities, we extend our best wishes. We are confident that the good results will speedily be made evident.

Trading With the Enemy.

GREAT BRITAIN being at war with Germany, Canada is at war with Germany. No Canadian citizen with a shred of patriotism in his make-up wants to assist the enemy of the state by fostering or aiding German industry.

Many branches of industry have already found it possible and practicable to substitute entirely all goods formerly secured in Germany. This condition is not applicable in its entirety to the medical and dental professions, there being certain drugs and materials essential to modern practice that are to be obtained only of German manufacture.

While the dental profession is to this limited degree forced to patronize German manufacturers, fully 95 per cent. of German dental goods now sold in Canada may be substituted without difficulty and with real profit to the dentist.

Canadian dentists are now pressing home to the dental dealers the question, "Were these goods made in Germany?" This sentiment will make it hard for dealers who have been handling supplies of cheap German manufacture to continue to sell these lines. It will also go far to rid the dental profession in Canada of the nuisance of the foreign carpet-bag man who peddles his wares from office to office, leaving the dentist to ponder over the experience and realize that inferior dental supplies are the most expensive the dentist can buy.

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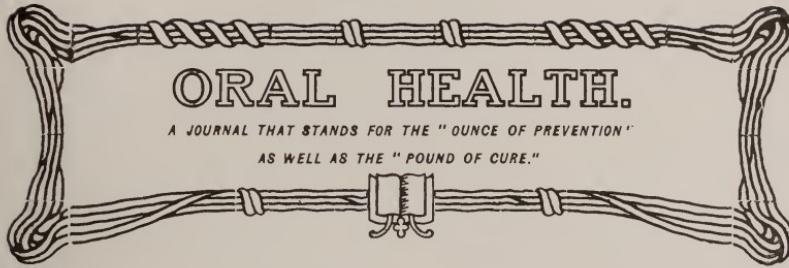
Getting Acquainted.

TOO much introspection is not healthy, but a man really ought to be alone with himself once in a while. He who has not learned to find rest and satisfaction and the truest kind of enjoyment in the quiet companionship of his own heart has not got into the real secret of happy living. If instead of putting forth the effort we sometimes do to make new friends and acquaintances in the social world about us, we spent some time making friends with ourselves, it might bring us an incalculable blessing. A man is either his own best friend or his own worst enemy, and he ought to know which.—*Guardian*.



R. H. Cowan, D.D.S.

PRESIDENT HAMILTON DENTAL SOCIETY



ORAL HEALTH.

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION"
AS WELL AS THE "POUND OF CURE."

VOL. 4.

TORONTO, DECEMBER, 1914

No. 12

*The Possibilities of Amalgam as a Filling Material.**

W. R. POND, D.D.S., RUTLAND, Vt.

AMALGAM as a filling material would seem to be a much frayed and badly worn subject. The truth of the matter is that when we take into consideration the tremendous amount of amalgam work done, it is strange that we should be satisfied with so little understanding of the material itself and with the results usually obtained by its use. We have been trying for years to perfect a technique for gold work, for porcelain, for the cements, and for all forms of dental operations, but have sadly neglected amalgam. We have neglected amalgam technique, but have not neglected to use the material in fully 75% of our filling operations. "Amalgam is to-day saving more teeth than any other one material in our hands"—this in spite of faulty technique, careless use, and many poor alloys. If we are to attain our greatest efficiency as operators and are to serve our patients to the best of our ability, it is obvious that the subject of amalgam must be given due consideration.

In presenting a paper before this society my object will be to review the situation and interesting matter regarding the subject, and to contribute what I can toward a better technique in operative procedure. I am not a metallurgist nor a chemist and have only the understanding of amalgam itself, which every dentist using the material should possess.

Many dentists are not interested in the subject of formulas and are content to use whatever alloy the trade representative cares to sell. This is a wrong situation, for without some knowledge of alloys and their composition we are not in a position to discriminate between the good and the

*Read before the Toronto Dental Society, Toronto, November, 1914

bad and to demand the best that the manufacturers can produce, nor are we capable of realizing what qualities an alloy should possess. Many of the easiest alloys to use are the least desirable as filling materials. Then too we should always know the exact nature of what we put in the human mouth.

The best definition I find for an alloy is by Matthiessen:

- (1) A solution of one metal in another.
- (2) A chemical combination.
- (3) A mechanical mixture—or all of the above.

Any metal or metals mixed with mercury forms an amalgam.

The first amalgam filling material of which I find record was introduced in 1833 and consisted in silver coin fillings mixed with mercury. In 1848 Dr. Evans, of Paris, introduced an alloy of tin and cadmium. This was a complete failure. In 1855 Dr. Townsend's alloy of five parts of tin and four of silver appeared and a few years later came the Lawrence alloy of tin, silver and copper. This alloy was low in silver according to the modern idea. Dr. Flagg later did the most notable work on amalgam, and until Dr. Black's exhaustive work on the subject appeared about 1895, was the best known authority and exponent of alloys and of amalgam fillings. Dr. Black's work with amalgams, while done several years ago, is with few exceptions, authority to-day.

So much for a brief history as a point of interest; now let us take up the modern alloy. In a list of sixty-four alloys given in Essigs Metallurgy, published in 1900, only ten contained over 50% of silver and just one reached 60%. In this list, L. D. Caulk's Par-Excellence alloy contained silver, 27.25; tin, 61.73; copper, 10.60; platinum, .25; and gold, .15; to-day, Caulk's 20th Century alloy is given: silver, 67; tin, 27; copper 4½; zinc, 1½. This represents about the change in ideas regarding correct formulas. Gold and platinum are no longer considered desirable metals for use in alloys. Dr. Black's formula is approximately 68 silver, 27 tin and 5 copper. This formula varies a bit, as according to the Black idea, which is quite generally accepted, a balance where there is neither expansion nor contraction must be struck between the silver and the tin. This must be done in making up each batch of alloy. The silver expands and is the element of strength in amalgams. The tin contracts and acts as a balance for the silver. Silver lessens flow and hastens setting. Tin retards setting, increases flow and weakens edge strength. 5% of copper adds 20% of strength. It neither expands nor contracts. Garhart says that copper is

used for the purpose of controlling shrinkage by producing quicker setting. Amalgams with much copper have a tendency to turn dark in color. Dr. Black condemns zinc as a mischief maker in alloys, but many good authorities think its good points more than counterbalance its bad ones. Zinc is used for the purpose of controlling oxidation at the time of forming the ingot. It facilitates amalgamation and helps maintain color. Dr. Black contends that an amalgam containing even 1% of zinc will continue to change bulk for a long time. Some of our alloys which have given the best clinical results contain a small trace of zinc, and having used an alloy of this type for nearly fifteen years I shall continue to favor it until unbiased and scientific tests show the zinc to be inadmissible. I consider the color of an amalgam filling a particularly important point.

The high per cent. silver alloys are quick setting. They are hard to mix and hard to work, and this fact leads many into the error of continuing the use of the easy working, shrinking, slow setting high per cent. tin alloys.

The flow of amalgam is its disposition to move under pressure. This is not of great practical importance, as good alloys possess more than sufficient strength to stand the stress of mastication. An amalgam filling of the best type possesses about the same strength as human dentine, namely, about 4,500 pounds to the cubic inch. The strength of amalgam is directly under control of manipulation both from its component parts and methods of making the alloy and from the way in which it is mixed and handled as a filling material by the operator. The strength of alloys is lessened by age; also too much mercury left in an amalgam filling is bound to weaken it. Too little mercury in the amalgam, by virtue of making a dry mass which cannot be properly condensed, will make a weak filling. Shrinkage and expansion of the filling are principally dependent on formula.

Spheroiding of amalgam is its tendency to assume a globular form while setting. Spheroiding is said to be caused by too much mercury in the mix.

The aging of alloys is an interesting physical phenomenon. Alloy freshly cut from the ingot sets more quickly when mixed with mercury than it will if left for sometime, and also the mix requires more mercury. The manufacturers overcome this feature by subjecting the alloy to heat for a given time. This process is called aging.

Many of the manufacturers utilize this process to produce different setting alloys from the same formula. According to McBain and Joyner, "Aging is a property of

the Ag₃Sn alone, contained in the alloys; it retards the initial stage of amalgamation, but does not effect the final product."

I have spoken of the Black formulas for alloys, which are quite generally accepted. Recently W. W. Atkinson of Philadelphia, brought out an alloy which he claims is based on the chemical theory of alloy making. Mr. Atkinson gives his formula as AG₂ Sn Cu. The metals are combined in the percentage of 54 silver, 30 tin and 16 copper. He claims that the metals are combined in relation to their atomic weights, and that the alloy will not discolor in the mouth, as its electrical and chemical affinities are satisfied. This theory and this formula are not generally accepted. A. Humboldt Sexton says: "None of the definite compounds is of use in the arts." We might quote indefinitely regarding this phase of the subject, but at present it leads to nowhere. As Dr. Grieves says: "An alloy is not a chemical compound nor a mechanical mixture—in fact nobody seems to know just what it is."

Now as to balanced alloys. At present the balanced alloys are doubtless the best and most accurate that we have, but that we have reached perfection in alloy making I do not believe, nor do I believe the word scientific can be applied (as Dr. McAuley used it) to the method of balancing alloys. Black says: "If it were possible to use chemically pure metals a fixed formula would be possible," and Crandall states: "Speaking accurately, there are no alloys which are perfectly balanced, at least I have never been able to find one. The best we can hope for at the present is an alloy which, when well amalgamated, after the setting changes take place, will show a slight expansion.

One or two other points regarding the situation in general, there seems to be no foundation for the homeopathic theory concerning amalgam. Dr. Riethmuller says: "As soon as amalgam has set, there can be no further action of the mercury upon extraneous substances, the alloy and the mercury having formed a unit." I will quote also Dr. Thielen: "The homeopathic theory seems to have no foundation in fact; it is not supported either by scientific investigation or chemical experimentation or observation, but is merely a hobby of some homeopaths and should not be encouraged by the dental profession." Dr. Buckley also makes similar observations. Another point which will bear looking up is the danger of mercurial poisoning from mixing amalgam in the hand. This seems a remote possibility, but is worth investigating.

Dr. Adolph Witzel has shown that so long as amalgam fillings exclude moisture and sulphureted hydrogen, there will be no discoloration of the tooth structure.

The first point to consider in the matter of operative procedure is to prepare the cavity for the filling. The Black system of cavity preparation covers the ground thoroughly and must be so well understood by all that it hardly seems necessary to say more than that this system is particularly applicable to amalgam work. I believe, that it is sometimes permissible, in filling bicuspid teeth with amalgam, to leave thin buccal walls if they are well supported by cement. Aesthetic reasons demand this. For amalgam fillings the margins must have a longer bevel than for gold, as a strong body of material is necessary for edge strength.

If amalgam fillings are cemented in, which is the writers invariable custom, the cavity can be very similar to that necessary for a gold inlay; in other words, little or no undercut is needed if the first layer of amalgam is pressed into a lining of soft cement. Why operators continue to use deep retaining points for anchoring fillings I cannot conceive. Having tested out this system for more than ten years I feel very confident regarding its efficiency. To quote Dr. Grieves: "The cemented in filling of either crystal gold or amalgam is the greatest thing in dental practice to-day," and again referring to the subject, "the line of cement is much finer than can be made by the most expert inlay operator." Dr. Grieves has also made the statement that there has never been a contact operation that did not leak saliva at some point. If this is true we are certainly, among other things, preventing discoloration by cementing in all fillings. Cement used with amalgam has other properties, and uses beside that of holding the filling securely. To those who wish to look into this matter thoroughly I would recommend Dr. C. J. Grieves' article, "The Cement Line in Inlays" (*Dental Summary*, 1913), for many of the points brought out in his paper apply to all cemented fillings. I will quote the following paragraph from his article: "It is now easy to understand how the finest contact operations may fail while the ordinary cement joint may stand in the same embrasure, for if the contact operation falls short at any point of absolute contact, capillarity acts, fluids enter, and the crevice fills with acid film, which so slowly attacks the cavo-surface enamel that the contained film, instead of being neutralized, receives just the percentage of alkalinity sufficient to maintain caries; in the cemented joint, as has been shown, the acidity of the film acts quickly on the more susceptible substance present, the cement, and the film is

made alkaline." I will also quote from an article read at the last International Congress by Dr. Z. H. W. C. Bodecker, for his findings regarding cemented inlays apply to all cemented in fillings: "The fact that cement hermetically seals the cavity, thereby overcoming the danger of a leaky filling, and that it also changes normal dentine easily destroyed by caries, into a tissue which has the appearance and the resistance of so-called senile dentine, is probably the reason why secondary caries hardly ever appears at the margin of a cavity filled with an inlay." The same author speaks of the lessened reaction of the pulp due to sudden thermal changes, owing to the insulating layer of cement.

Regarding the use of the rubber dam in amalgam operations, I wish to say that I rarely consider it indicated, provided the cotton rolls and saliva ejector are intelligently used and all things arranged for a careful but expeditious operation. Washing the cavity and margins with warm alcohol precludes contamination from the saliva and thoroughly dries the field of operation. Many good cavity preparations extending beneath the gum would be extremely difficult cases for the use of the rubber dam, and a rubber dam clamp would interfere with the use of a matrix. One of the principal points against the use of the dam is the necessity for immediate closure of the jaw to note the occlusion and particularly the movements of the mandible. This must be done at once and before the filling begins to crystallize, at which time there is great danger of crushing and breaking down a carefully contoured filling. This danger is nil before the filling has commenced to set. The saliva does no damage to the filling material after it is in place.

The use of a matrix is absolutely indicated where one or more walls are to be restored. A little cocoa butter rubbed on the matrix prevents adherence of the cement and amalgam to it. Except where a matrix is left on (in very large contours) until another sitting, I prefer to practically finish a filling in one operation. With sealers, files, and non-cutting polishing strips, all the work, except the high polish with pumice and chalk can be done at one sitting.

A few points we might mention here are necessity for pure mercury and for a thorough kneading and mixing of the amalgam. Use filings, not shavings, as they make a structually stronger amalgam. If the mercury is promptly wrung out, an excess does no harm. A "sloppy" mix, which makes a weak filling, must be avoided, and likewise it must be remembered that if the mix is too dry and extraordinary pressure is necessary in order to make it cohere, the result

will be a brittle filling.

We now come to the point of restoring correct tooth forms, a natural occlusion and proper contact points, some of the most difficult and necessary points in filling work. The matter of contact points has been so thoroughly gone over and demonstrated by Dr. Black that it only seems necessary to say that amalgam fillings which lack in this respect must be considered failures. This is a weak point with many of our plastic fillings, and a matter we must correct if we would save teeth instead of destroying them. In restoring natural tooth forms and occlusion we must study dental anatomy and understand occlusion. How beautiful and how efficient is normal occlusion, and how well worth while it is to produce this perfect condition as nearly as is possible by orthodontic treatment and by our filling restorations. In studying dental anatomy one cannot fail to be impressed with the wonderful tooth forms nature has developed; each plane, each groove and sulcus so perfect in its detail, and so efficiently arranged for practical use. How much is lost in efficiency and beauty when we fail to reproduce these natural tooth forms. How much the flat polished occlusal surfaces of most of our fillings lack.

Developments in cast inlay work have shown splendid possibilities of reproducing the correct detail of tooth forms in this class of fillings, and unless we can get the same results with other filling materials, we should certainly not be justified in using other methods for the bulk of our occlusal restorations. One of my principal aims this evening is to show that amalgam can be carved to reproduce as accurate and as artistic results as can be accomplished with the cast gold inlay. I trust my lantern slides of clinic models and cases from practice will furnish sufficient proof of this.

In closing this paper allow me to quote again from Dr. Black, who says: "The idea that amalgam is a cheap filling, to be done quickly," in any old way, should be discarded forever. The dentist should have the same pay for time in making amalgam fillings as in making gold fillings and should take the time to do it well." To this very practical thought I should like to add this: How can one consistently demand a good fee for an amalgam operation unless he is willing to use the best alloy money can buy and efficiency produce? Let the demand for cheap alloy cease. Let us be willing to support research work which will straighten out many questions regarding alloys and amalgams. Let us remember in using amalgam that it is restorations we are called on to do, and that the "office of a filling is to restore the form and

the physiological function of the tooth." Above all let us be first and last for discrimination in the use of filling materials. No dentist who uses discrimination in his work can fail to take amalgam seriously nor can he miss seeing its possibilities as a filling material.

A Rainy "Day Dream."

BY HABEC.

COMFORTABLY ensconced upon the broad and expansive porch of the Olcott Beach Hotel, lulled into a dreamy state by the lapping of the listless wavelets along the sandy shore, while the misty grey shroud spreading over land and water alike is sending earthward a steady sheet of the finest diffusion of heavenly aqua. On this first day of September, gazing into the imaginative distance toward Toronto, where the great exposition is in progress, one may suspect that even the elements are gently weeping because of the sorrows and the horrors of the great conflict of nations in which loyal Canada is taking her just part. And the flies; those affectionate flies; how can one ever forget them! Why is it that you seem to be the only person in the whole world to whom they can cling on a moist and sticky day? Such affection is worthy of better returns than they usually get, but "swat 'em" is a weak and impotent phrase when applied to the numberless armies which rise up before you. Methinks that even the German army would be compelled to reckon with the pestiferous hosts. But such trifling incidents are a necessary part of the summer holiday, and this particular one has demonstrated to Habec the "unwisdom" of day-dreaming with the mouth open.

Howsomever, Habec is not the only dreamer of the editorial staff of ORAL HEALTH, for no less a person than his superior in rank, Ye editor, has owned up to this supposedly senile weakness, usually ascribed to internal dissension between the great German allies, Sauerkraut and Weiners. We are sure it was fully as bad as that in the case of Wallace, for his letter says: "I dreamt last night" (do you notice the poetiness?) "that you had written a whole trunk full of manuscript for publication in ORAL HEALTH." Of

course there is nothing like sarcasm hidden beneath those prickly words, but even so Habec refuses to dig for them, for his sensitiveness has a prennial exposure of the nerve. Yet he is happy to acknowledge that Wallace has many commendable virtues which he would emulate. The worthy editor also refers to sending the manuscript by freight. It would scarcely be in keeping for so well-bred a gentleman to more pointedly suggest that Habec need not hurry about shipping the consignment and he has, therefore, acted accordingly.

HONORS AND DISTINCTION STILL PURSUE US.

As we approach the silver jubilee of our induction into the insoluable mysteries of the dentist's vocation, many new and strange moods seem to possess us, and we oftentimes wonder if the one talent our parents bequeathed us is not suffering from dementia precox or profound anaesthesia. During this quarter-century run Habec has been more or less democratic in his views and customs regarding the style of his operating coat. He has worn all colors, shapes and varieties, and has always kept them clean. For several years past he has realized that fate was gaining on him lap by lap, and that the white coat would get him if he didn't watch out. Well finally it has got! Habec is now Phoebe Snow from the equator up. Not that we regret the change (except what goes for launder), for we feel quite set-up over our apparent spotlessness. However, it engenders profligate extravagance, for it demands a change of collar at least once a week whether it is needed or not. Yet we may have recourse by advancing our fees to supply the extra collars. Herewith Habec bows his cringing soul in humiliating confession, and yet methinks, others of his ilk have felt the same. He feared the semblance of the barber. With all due respect to the linguistic knight of the clippers, Habec felt that by adopting his costume, in some intangible way the dentist robbed himself of his natural right to the grandstand and relegated his dignity to the bleachers. It seemed to be something like that any way. Perhaps it was more like taking the mint sauce from the roast lamb. At any rate it sort of changed the taste of Habec's self respect.

But a great change has taken place; the loss has been regained and the white coat has been forever elevated to a standard of superiority from which it may never be dislodged until "votes for women" gain the day. Shall we tell you why: Yes Well, last week Habec's coats came from the laundry duly classified as "Bar coats." No longer need we fear a request for a "close shave," "bay rum" or a "hot

towel." How much more "spiritual" might be a plea from a red-nosed patient for a "few drops of courage" or any of the long list of mixtures of which the artist in the white coat is the gracious purveyor. O, yes! As a profession we are progressing. Even now many of us are on very familiar terms with those esteemed dispensers of malt extract, et cetera, and it is quite an inspiration to our sense of dignity to hear their happy greeting: "Hello, Doc., whattluhav?" And still no signs of peace in sight.

SHOULD NOT'S—BECAUSE.

In which Habec endeavors to tell what a dentist should not do, and thereby discovers that he is an acutely mirrored example of much that he would have others avoid. He also realizes that the fellow who lives in a glass house should not cast rocks lest his neighbor return the compliment with a machine gun. With this apology for not being a German soldier, he submits the following as a means of robbing you of some valuable time which you might otherwise employ to much better advantage.

A dentist should not be other than a real man. Of course this applies to all conditions and classes of men, but it seems particularly applicable to the dentist. A real man is supposed to be just about the finest piece of architecture that the Great Architect ever conceived. Be it town or country, city or metropolis, the fundamentals of the dentist are always the same. He should not be the worst man in town, for if he is all that he should be in the eyes of the public, his advice and counsel is oftentimes sought by his patients. In fact he may expect to be asked his opinion upon matters ranging from the best kind of hogs to breed, to the relations of the tango to mental science. Many of his patients actually think he is the real thing, and this fact should be the strongest incentive for him to prove that they are right. Advice given under such conditions must be carefully weighed, for it may be life-long in its effect. As we grow older in our profession we find ourselves taking on greater importance in the eyes of our patients, and we are treated to confidences much as a family doctor is, and it is not unusual that the dentist finds himself in a position to straighten out family affairs of a private nature, even though many seem to think that the dentist has a penchant for causing just such complications.

A dentist should not get deeply into politics. It is proper that he should take sides, but he should avoid making soap-box orations or running for office, for he will make enemies which will be with him all his life, besides losing

much patronage. If he wishes to be a pillar in the church, that surely is his own business and is, no doubt, just as it should be, but it never gets a dentist anything if he hands out business cards every time he speaks in meeting. A dentist should not discuss religion with his patients of different religious persuasion, particularly while in his office. Everyone has a right to his opinion on this subject and it is a matter beyond open discussion. Pronounced and radical views will only result in making enemies and change no one's personal opinion.

A dentist should not be intemperate. Habit good or bad masters everybody. It is paramount, all-controlling, unavoidable. But as a kindly providence has seen fit to ordain, it is entirely within ourselves whether we bow to a good or bad one. We may have our choice and one is, perhaps no more powerful than another. We all know from observation and experience that cleanliness is the best habit a dentist can form. It is Habec's custom when talking to students to impress them with the great importance of this matter, and that although it is said that "Cleanliness is next to Godliness," they are told that *cleanliness is the Godliness* of our profession, and it is a fact that we receive greater compensation for every hour devoted to personal care than we do for any service performed at the chair, provided we are not fussy or fastidious. A dentist should be clean—and look it too. First impressions mean everything to us, and if they are unfavorable, our patients rarely overcome them. A dentist, like every other human being, is known by the company he keeps out of. Surroundings and environment mean much to the dentist, and the best we can secure are none too good for us.

No dentist is free to act under moral or civil laws unless he chooses to do right. He can employ natural forces only as he acts in accord with natural laws. When he enters his profession he must accept the conditions imposed by organization, which means compliance with rules of conduct. The organization of our profession is reasonably complete, and we are bound together by the spirit of professional brotherhood, and are in duty bound to maintain our professions' honor. Love for it should make us defenders of the virtues of our profession, and our pride in the grand work it has done should make us jealous of its reputation. We all realize that the sphere of its usefulness is almost illimitable. Scientific development is so rapid in our art that it is with difficulty that the average practitioner keeps apace. Yet he must do so and even be a teacher as well.

Dissemination of knowledge among our patrons to the aggrandizement of our profession should be our special aim. Extension of its sphere of usefulness must come through the education of the public, together with the application of such knowledge.

We must bear in mind that the public will place no higher value on our profession than we do ourselves, and a dentist can best defend himself by defending others. Respect by the laity can be anticipated only to that degree by which we show respect for each other. People usually judge a class of men by the individuals of that class with whom they come in contact. If we are courteous, polite and refined in our manner; frank and open, yet conservative in our expressions; enthusiastic in the defence of our profession and its members, we must, at least, command respect and confidence.

A dentist should not lose sight of charity in his work, for, when properly administered, it will prove a source of much pleasure and satisfaction. As with mercy, so with charity; it "falleth like the gentle dew from Heaven and is twice blessed; blessing them that give and them that receive." Dentistry belongs to the so-called benevolent professions, hence charity is one of its component parts. It is trueism that "To give is but to receive," and Emerson says: "He is great who confers the most benefits; He is base who receives favors and renders none." It seems to be a positive principle that we must assist others, for someone has said that "He who seeks to promote self can never attain to any great heights." Habec has always lived in the conceit that a dentist is a gentleman, which has been defined as "A man of honor and high principles; a man of good breeding and politeness." However, politeness is oftentimes but a veneer, and when it is not tempered by good breeding and culture, it savors of grossness and vulgarity. When accompanied by the better qualities of kindness, forbearance and sympathy we have combined all the elements of manliness which makes the ideal dentist. Personal dignity, an exhibition of force of character, of honest, earnest purpose, coupled with the above, is the sum total of the real professional man. This is a class worthy of cultivation lest the species become extinct.

A dentist should not be slow in his work. In other words, he should be as expeditious as is commensurate with good service. We should avoid touching a cutting instrument to sensitive dentine without a firm rest or support and then make quick decisive movements. With keen cutting instru-

ments, little pain usually is produced. In the present so-called progressive age our clientele feel that they have a right to expect easy and rapid operations by us. It should be our custom never to allow patients to occupy the chair, even for a minute, without making them feel that something definite is being accomplished. A very little of our society goes a great way with a majority of our patients.

A dentist should not be vacillating. He should be positive of his diagnosis and of his advice, before he gives it. It is the only way he can gain and regain confidence. He should not lack energy. Plenty of good old "pep" is as useful in dentistry as in any other walk of life. Everybody likes the "live wire," for they feel sure he is up to date. Whether in town or country the effect upon others is the same. He should not be conspicuous by his absence from dental meetings. Whenever he anticipates attending a convention, he should let those of his patients with whom he comes in contact know it, and he should always make it a point to take at least one practical idea home with him so that his patients may feel that they have benefitted thereby.

A dentist should not be narrowminded. Perhaps one of the unfortunate conditions of our profession is that our horizon is bounded by the orbicularis oris, and the greater part of our waking hours are spent inside three narrow walls of enamel, and to make our vision still more constricted we are continually looking into the narrow cavern formed by those walls instead of looking from within outward. A dentist must fight an ever-growing tendency toward restricted mental vision, and as year after year rolls by with ever quickening speed, he should keep close watch upon himself lest his whole world becomes defined by the limited circle of his own office. It is so easy to slip backward, and when a dentist finds himself on the toboggan he should make good use of the emergency brake. We must remember that our profession has its depressing influences for, no matter how cheerful one may try to appear, we have a chronic habit of continually "looking down in the mouth."

A dentist should not permit himself to get into a rut. He must keep making changes in his methods, even though they may be slight, otherwise he will eventually become a back number. Habec believes that each dentist should make himself known in his community as being especially proficient in some particular department of his practice. Do something, no matter how apparently inconsequential, that the other fellow does not do, and be known through it. If you attempt to become a "general specialist" you will find your-

self no specialist at all. Ofttimes the greatest names have grown out of the simplest things. What was Joseph Jefferson without Rip Van Winkle and, likewise, what was Rip Van Winkle without Joseph Jefferson? Since the demise of his old friend, Joseph, Rip has gone back to his long nap accompanied by the spirit of the one who made him famous.

A dentist should not be a "sucker." That is a less elegant than forceful expression, but you all know what is meant. It is said that the names of a majority of the dentists of the country are on the so-called "sucker list" of Wall Street, and there must be some truth in the statement, for the "come-on" man is ever with us and always does us the honor of coming direct to us with those rare opportunities for wealth which have been created especially for us. We are their lawful prey and they fatten on our substance. Show a few of them the office door and the rest will leave you alone, for they are like tramps, they pass the good word along that you are either a "good thing" or the "original tight-wad."

Here is where Habec particularly shines as a personal example of what a dentist should *not* be. He may not appear to be so distinguished, but modestly acknowledges to you that he is president of several holes in the ground that a gang of desperados were paid to dig, presumably looking for gold and silver. Habec assures you that *they* were looking for it and they found it in the pockets of easy ones like the personal example he represents. And as for being vice-presidents and directors—why, really he doesn't bother with such small honors any more. He has a whole trunkful to give away. The only concern that looks good to Habec now is The Common Sense Manufacturing Company, and believes that several shares of its stock should be attached to the diploma presented to the embryo dentist.

Just here let us tell you that we are convinced a dentist should do. It may seem an odd notion to advance to dentists, but we will take the chance. We believe he should talk it over with his wife. It can do no harm and may do a great deal of good to her, and then, of course, he will do just as he pleases, anyway. Perhaps some may prefer to talk it over with the other fellows' wife, but as a general proposition we would advise you to apply to your own wife for good advice in business matters. They are usually pretty clear thinkers, and it is proverbial that womans' intuition seldom misguides.

A dentist should not forget that the best investment he can make with his brains and his money is right in his own

office, at least to the extent of good judgment. His equipment should be the best obtainable for his use. We often make the mistake, however of overdoing it by installing every new and novel appliance that comes along. The young practitioner particularly needs to be warned in this respect, but the more seasoned ones, however, can profit by the idea to the extent of occasionally making some change in the office or equipment which will give his patrons the impression that he is strictly up to date. This is a legitimate way of advertising and will be found most profitable, also.

A dentist should not buy cheap stock. Not only does he lose through inferior material in his work, but he can not demand as high a fee as otherwise, and surely nothing is more humiliating to our professional pride than to be called cheap. Don't buy cheap stock, but you have a right to buy good stock cheap, if you can. Habec has not had that happy experience as yet, and doubts if he is an exception to the rule.

A dentist should not chase fads and fancies. He is in duty bound to keep up with the times, but the chronic fadist is pretty sure to eventually find that he has a larger stock of fads on hand than he has victims to try them on. We have had patients express themselves as having left the other fellow because they were "tired of being the dog." Let the enthusiasts prove a new method's merits and then get in on it before your neighbor does. Fancies are less harmful than fads, because they live in the imagination and can do no material harm. We believe in fancies, for they relieve the monotony of the daily grind and elevate us beyond the cold and selfish world, but when they are boiled down into fads, one should pass them along to the other fellow.

And lastly, a dentist should not think that he can fill all the teeth in the world during his natural period of practice. Even with all our ambition there still will be dentistry to be done after we have gone to our just reward. There seems to be divergence of public opinion as to what the dentists' just reward may be, however that depends largely upon which end of the instrument the situation is viewed from. But the point we wish to make is that the dentist above all other professional men must have a due admixture of rest with his duties. One solid month in the open each year is little enough to reoxygenate his blood and rest his frazzled nerves and jaded brain. A dentist can do just as much work in eleven as in twelve months. Try it and be convinced.

The Oral Hygiene Convention of the Ontario Dental Society.

R. J. READE, M.A., M.D., D.D.S.

ACCORDING to instructions received from the Ontario Dental Society, the Executive of the Oral Hygiene Committee called together a conference of the workers of the propaganda for Oral Hygiene in Ontario, on Tuesday, November 10th, to discuss the question of Oral Hygiene in its various relations to the Province.

The first part of the programme was a visit to the School Clinics. At 10.30 in the morning automobiles were in attendance at the Royal College of Dental Surgeons to take the delegates to Earlscourt Public School. Under the direction of Dr. W. H. Doherty, Toronto Public School Dental Inspector, the method of carrying on the work at the clinic, and of keeping records was explained to the delegates. After a very interesting and profitable morning spent in the school, the delegates were taken to the Canadian Club for lunch.

After lunch the Municipal Dental Clinic was inspected. Dr. J. A. Bothwell, Chief of Staff, explained to the delegates what work the clinic was undertaking, and the methods of carrying on the work.

From the Municipal Dental Clinic the party was conducted to the Royal Ontario Museum, Bloor Street, where Dr. R. G. McLaughlin, Chairman of the Executive of the Oral Hygiene Committee, had made arrangements to have the party personally conducted through the Museum. After a most interesting time spent in the Museum, Dr. W. E. Struthers received the delegates at his office in the City Hall.

The evening proceedings began with a dinner tendered to the visitors at the Walker House. The following members of the different Oral Hygiene Committees sat around the tables : Doctors W. Cecil Trotter, Toronto ; A. J. Broughton, Toronto ; Geo. W. Grieve, Toronto ; R. G. McLaughlin, Toronto ; Oliver Martin, Ottawa ; W. R. Greene, Ottawa ; F. C. Husband, Toronto ; J. A. Bothwell, Toronto ; O. A. Marshall, Belleville ; J. P. Marshall, Toronto ; H. E. Eaton, Toronto ; P. T. Coupland, St. Mary's ; E. H. Eidt, Stratford ; M. A. Ross Thomas, London ; S. P. Reynolds, London ; A. E. Santo, London ; W. A. Black, Toronto ; F. C. H. Briggs, Hamilton ; J. Frank Adams, Toronto ; A. W. Ellis, Toronto ; D. Baird, Toronto ; W. M. Wunder, Toronto ; W. E. Will-

mott, Toronto; A. E. Rudell, Berlin; R. D. Jarvis, London; A. E. Grant, Toronto; W. H. Doherty, Toronto; A. H. Mabee, Gananoque; J. F. Simpson, Trenton; R. J. Reade, Toronto; C. A. Kennedy, Toronto; R. T. MacDonald, Hamilton; Wallace Secombe, Toronto, and A. E. Webster, Toronto. There was also present Dr. W. E. Struthers, Chief Medical Inspector of the Toronto Public Schools, and Dr. J. Wright Beach, Dr. M. Burton Eshleman, and Dr. J. O. Frankenstein, from Buffalo, N.Y.

After the dinner the Chairman of the Executive, Dr. R. G. McLaughlin, Toronto, addressed the meeting as follows:

CHAIRMAN'S ADDRESS.

R. G. McLaughlin, D.D.S.

Gentlemen,—My first duty as chairman of this conference is a most pleasant one—to bid cordial welcome to our visitors from the United States. We appreciate very much the honor they have done us by their presence at this conference.

For about one hundred years we have enjoyed the good will and friendship of that great republic to the south of us, and at no time during these years have we valued that friendship more than we do to-day.

In the titanic struggle in which we, as British people, are now engaged, it is a source of great satisfaction to know that behind us is the moral support of the best thinking people of the United States. President Wilson and his administration have adhered strictly to the position of neutrality and rightly so. We would not have it otherwise.

Perhaps we are like the Scotch captain, who, the night before the expected battle, went aside for meditation and prayer. The hated foe was just across the valley, and the old captain was on his mettle, and so he ground his teeth and prayed: "Good Lord, on the morrow when the battle rages dinna thou be on our side, and dinna be on the ither side, but stand awa off and you'll see the grandest ficht o' your life."

Now to speak of this conference—the Executive Committee is gratified at the way you have responded to our efforts to make this a success. It surely speaks of a growing interest in the good work of Oral Hygiene.

There are at least two reasons why we should hold a special conference on this particular subject of Oral Hygiene.

1st. At the Annual Convention of the Ontario Dental Society there is not sufficient time for the proper discussion of this subject.

2nd. Throughout the different parts of the Province there are signs of a coming demand for organization for the purpose of proper and regular dental inspection in our public schools. When any such agitation does arise, the local dentist will be expected to take the lead; and the information and inspiration derived at such a conference as this should be helpful.

The progress of the Oral Hygiene movement in Ontario is, I think, fairly satisfactory. Five or six years ago, when the movement was first launched, it did appear to some of us pretty much of a forlorn hope. However, in looking over the field to-day the signs are most favorable, and we cannot but conclude the officials and public are realizing the importance of the movement.

To-night we are to hear from our two city officials—the Superintendents of the Civic Clinic and the School Clinics respectively, and from their reports you will be able to gather something of the magnitude of the work already done here.

Dr. Bothwell, of Stratford, will open the subject of the work in the country section, which we hope will be followed by reports from every part of the Province.

This year the Oral Hygiene Committee has had specially in mind the problem of the rural school. And we are taking steps to have at least two matters of importance brought to the notice of the Minister of Education.

1st. That at each Normal School in the Province a course of lectures on Oral Hygiene shall be given regularly by a competent dentist to the teachers in training.

2nd. To urge that a specially prepared handbook on Oral Hygiene be issued by the department to every teacher in the Province of Ontario.

If these propositions be carried out, we feel assured the pupils in the rural schools will have better instruction on the importance and care of the teeth.

The Education Department has recently issued new regulations giving power to school boards in any part of the Province, under certain conditions, to establish a system of dental inspection in any particular school or schools—also to employ a competent dentist to carry on such examination, as well as providing him with proper facilities and equipment. Thus you see the machinery is already provided for you in any part of the Province, all that is necessary is to set this machinery in motion.

Dr. McLaughlin then called upon the Secretary to make a few remarks concerning the matter of Oral Hygiene in its

relation to the volunteers for active service, which was to be brought to the notice of the meeting. The question was a consideration of the means to be adopted so that all recruits for service in the army in the present crisis should not be rejected when the fault lay with the teeth alone, if such repair could be made as would satisfy the medical authorities. To that end the following resolution was proposed by Dr. R. J. Reade, Toronto, and seconded by Dr. A. E. Santo, London, and unanimously and enthusiastically approved: "Moved that the Executive of the Oral Hygiene Committee of the Ontario Dental Society be instructed to approach the proper military authorities of the Province of Ontario to endeavor to make satisfactory arrangements whereby the teeth of recruits for military service be put in proper condition to meet the requirements of the military department, when such defects are the sole cause of rejection, and when the remedying of such defects will be the means of having their applications accepted. The dentists of Ontario will undertake such patriotic service at their own expense, to increase the supply of recruits to defend our Empire, and to uphold the highest ideals of liberty."

The Chairman then called upon Dr. J. A. Bothwell, Superintendent of the Municipal Clinic in Toronto, to address the meeting regarding the work done in the clinic.

MUNICIPAL DENTAL CLINIC.

J. A. Bothwell, D.D.S.

Dr. Bothwell stated that the Municipal Dental Clinic had been established for nearly two years and was now on a splendid working basis.

The first of July this year he made his semi-annual report, and found that the work completed in the six months amounted to somewhat more than for the whole of year 1913. Thus he hoped and expected that the total amount of work done in 1914 would be double that of 1913.

A comparison of the following figures would be interesting in this connection:

	1913 (year)	1914 (6 mos.)
Extractions	4,526	5,000
Treatments	3,413	3,061
Fillings	5,405	4,225
Completed Patients	1,285	1,360
Local Anæsthetics	264	521
General Anæsthetics	101	237
Crowns	12	10

This increase was due to both an improved system and increased efficiency of the operators in handling the patients.

They had had many interesting cases in the clinic during the last year. A short time ago a girl, nine year old, had come with what was supposed to be an alveolar abscess, but upon careful examination was diagnosed as sarcoma. The child was sent to the Hospital for Sick Children, was operated upon and was now well. This was one instance where inspection and treatment had done a lot for the child by finding the trouble early.

They had many cases of abscess pointing on the outside of the face. Some of the cases had necrosis, and these they now handle at the clinic under a general anaesthetic.

They see a great many unclean mouths, but the worst mouth he ever had seen was in a child five and a half years of age. This boy had pyorrhœa so bad that every temporary tooth in the two jaws had an exposed root from the gingival line to the apex. The amount of pus and tartar was terrible. The case responded very well to treatment, but the child would not care for it, so it did not progress well.

The public schools did no major extracting or administering of anaesthetics, so the patients came to the Municipal Clinic on Fridays to have that work done. Friday was set apart for general extraction, and from 30 to 50 patients were seen on that day. Both general and local anaesthetics were used in this work.

The children that attend this Municipal Clinic came from Public and Separate Schools and Orphanages, and all other charitable institutions where children were kept.

SCHOOL DENTAL CLINICS.

W. H. Doherty, D.D.S.

Dr. W. H. Doherty, who is in charge of Dental Inspection and School Dental Clinics in Toronto Public Schools, gave an account of what has been accomplished in improving dental conditions among public school children.

He pointed out that after his appointment in 1911, there was no means of obtaining treatment for needy school children. As a result, the work of that time was largely educational in character. Lectures on Oral Hygiene were given before mothers, teachers and school nurses. A set of Oral Hygiene charts was placed in each school. These charts, with their illustrations, formed a basis for talks to the children by the teachers. Tooth brushes and dentifrices were provided at a nominal charge.

Dr. Doherty stated that the foulest dental conditions found among public school children were in mouths where deciduous teeth were too long retained. He stated that

before any school dental clinics were established he had extracted some thousands of these teeth and thus cleaned up many mouths. This work was done with an ordinary chair, a basin, a pan and gas for sterilizing forceps, and means for washing the hands. He recommended this as a work that can be done in any place where the dentists are interested in doing something practical.

As a result of this educational work, together with the work of the school nurse and school physician in urging upon parents the importance of care of the mouth and teeth of the school child, much good had been accomplished. Hundreds of children had gone to their family dentists. About fifteen hundred teachers learned something of oral hygiene and thus formed a small army for the spreading of this gospel. Thousands of tooth brushes and packets of dentifrice had been disposed of, and the school children generally had greatly improved the care of their mouths. The work of the school nurses in this campaign for clean mouths has been particularly valuable.

At the present time he stated that there were thirteen dental clinics in as many different public schools. Each was in charge of a dentist who devoted half of each school day to the work. The salary was \$800 per year with a yearly increase of \$100 to a maximum of \$1,200.

Dr. Doherty referred to the inaccuracies in published statistics of results accomplished in various dental clinics. In many places where a child made a dozen visits before treatment was complete, this was recorded as a dozen "patients," making an altogether useless and inaccurate set of statistics. In Toronto a "patient" meant a child with all required treatment, completed. He referred to the similarity between statistics in the School Dental Clinics, the Municipal Dental Clinic and the Clinics in Cincinnati, where accurate records were kept of the "completed cases."

The record of results in the School Dental Clinics of Toronto for 1914 were as follows:

Month.	Number of Clinics.	Completed Cases
January	4	151
February	4	148
March	4	178
April	6x	161
May	8	296
June	10x	340
September	9*	308
October	9*	378

xThe two new clinics open only a few days.

*One clinic closed temporarily during alterations to the school.

During October there were three school holidays, and one operator was ill for a couple of days. On a basis of 378 completed cases, with these lost days, a full month would have meant an average of about fifty completed cases per clinic per month, which he considered a fair average for any half time clinics, where thorough treatment was undertaken. In addition there were each month a number of emergency cases for the relief of pain.

The following table showed the steadily increasing efficiency of the Department of Medical Inspection in getting results in dental treatment.

(Number of children who received dental treatment at clinics or family dentist.)

	1913	1914	
January.....	234	January.....	819
February.....	277	February.....	833
March.....	399	March.....	894
April.....	649	April.....	761x
May.....	516	May.....	836
June.....	744	June.....	1197
September.....	808	September.....	988*
October.....	826	October.....	1081
November.....	862		
December.....	656x		

xChristmas and Easter holidays.

*School opened.

In 1911 the examination of Elizabeth Street School showed 99 per cent. of the children needing dental treatment. Church Street School had about 92 per cent. needing treatment. In practically all places where no attention had been given to oral hygiene the average percentage of children needing treatment was 95. Moose Jaw recently gave that percentage, Andover, Mass., had the same. The figures were fairly uniform at 95 when dentists made the examinations. Present conditions in Toronto showed a remarkable decrease due to the work of the Department of Medical Inspection. Some recent results were as follows:

Elizabeth Street	69	in 1911	99
Church Street	58	in 1911	92
Earlseourt	56	in 1911	95
Morse	78		
Connaught	75		
Strathcona	65		
Annette Street	70		
Niagara	78		
Hughes	70		

Sackville	72
Carlton	74
Dovercourt	71
York	71
Park	68
Brock	67
Pauline	71

Dr. W. E. Struthers, Chief Medical Inspector of the Toronto Public Schools, gave a short humorous address, and spoke very sympathetically of the work being done by the Ontario Oral Hygiene Committee.

Dr. J. A. Bothwell, of Stratford, then read the paper of the evening, "The Plan of the Work to Meet the Difficult Problem of Rural Schools' Dental Inspection and Clinics." This paper will be found published elsewhere in ORAL HEALTH.

Dr. Oliver Martin and Dr. W. R. Greene, of Ottawa, spoke of the work that was being done in their city. The Ottawa delegates asked the committee to enquire into, and if necessary make efforts to obtain such changes in the Act as would place the School Dental Clinic upon a more satisfactory basis.

Dr. P. T. Couplands of St. Mary's spoke very encouragingly of the work they were endeavoring to do in that place. The knowledge of what dentistry had to offer to the public was being spread by addresses to the Womens' Institute. Dr. Coupland also intimated that they were trying for medical and dental inspection to be carried on by employing a nurse for the school.

Dr. J. Wright Beach, of Buffalo, gave a humorous speech, and spoke of the work carried on in Buffalo. He also told the meeting of the hearty sympathy the people in the States had for us in our present struggle for the highest ideals of liberty. He did not think that we needed any help, but if we did, there could be no doubt as to the side on which the United States would be found. These sentiments were greatly applauded.

Dr. M. Burton Eshleman, of Buffalo, also gave an account of the difficulties they had in obtaining money to carry on the clinic. The difficulties they had with their City Council were much the same as the difficulties experienced elsewhere.

Dr. R. T. Hamilton, of Hamilton, spoke of the progress that was being made in Hamilton. The value of the work to the children was such that he had no doubt that in only a short time there would be dental clinics in all Public Schools.

Dr. M. A. Ross Thomas, London, stated that they were

just beginning to get to work in London, and hoped that at the next meeting they would have to report a considerable progress. Dr. Thomas heartily approved of the work that was being carried on by the committee.

Dr. Frank E. Bennett, of St. Thomas, highly complimented the School Trustee of their town, Dr. Taylor.

Dr. Oliver Marshall, of Belleville, said it was difficult to get work introduced into the Public Schools of Belleville, but he had given lectures to the Womens' Institute, and he also examined regularly those in the Deaf Institute at Belleville, and during the visits when examinations were made, all the extracting necessary was done. This work was carried on and paid for by the Ontario Government. Dr. Marshall suggested that the committee endeavor to have the Government appoint one man who would visit all such institutions throughout the Province of Ontario, and do the necessary work. The Chairman told Dr. Marshall that the committee had endeavored to bring this about, and had almost succeeded, but will endeavor further to have some appointment made.

Dr. Douglas M. Foster, of Guelph, reported to the committee that the prisoners on the Prison Farm were taken to dentists to have their teeth attended to, and the expenses were paid for by the Government.

The meeting adjourned at 10.45 o'clock, all expressing themselves highly delighted with the proceedings of the day, and all speaking of the pleasure of looking forward to the next conference.

Dental Inspection and Clinics in Rural Schools.

J. A. BOTHWELL, D.D.S., STRATFORD.

WHEN asked by your Secretary to give a paper on this subject, I consented rather hesitatingly. Things have been happening so fast along these lines of late that we are liable to feel somewhat unsettled. The Government have issued some recent regulations on this question and it would not be too much to expect that ere long dental inspection in all public schools would be compulsory. In fact until such is the case the problem presents grave difficulties.

What is meant by Rural Schools?

To some of you this may mean all schools outside of Toronto and a few of the larger centres.

We in the smaller cities and towns take it to mean those isolated schools in the country districts. However, for the present we shall take it to mean the former. For dental inspection in the schools of the smaller cities and towns the way is rapidly opening up and already in many of them is an accomplished fact. The education of the public and agitation on the School Boards are factors in its realization. The public is somewhat wary and inclined to be suspicious of ulterior motives, so we as dentists must not appear in the forefront of this agitation. Get close to some member or members of the School Board in your town and seek to convince them of the necessity and let the promotion of the idea on the board come from them. Public opinion is rapidly advancing along these lines, and with proper handling there are few towns in the province where the work would not be soon undertaken.

Before taking action, the School Board should take the Medical Health Officer into their confidence and get his co-operation. Care should be taken to incite no opposition.

Where medical inspection is undertaken I believe that dental inspection may be well accomplished through the same official. A specially trained nurse may attain splendid results.

The visiting of the homes is an important factor, and I believe a nurse is better fitted for this work than a professional man.

With respect to clinics I presume the free clinic is meant.

We should, I think, go cautiously in this matter, so that assistance may be given only where it will do good.

It is easy to cultivate a spirit of dependence. We Canadians, as a class, do not care to accept charity, and it is well.

The farther remote we go from the large centres of population, the less need do we find for free clinics.

There would not be sufficient need in most of the smaller cities and towns for the employment of the full time of a practitioner. The plan that we would suggest then would be to engage a portion of the time of a dental surgeon in each locality where such is found necessary.

Now to take up the question of inspection in the isolated schools in the farming districts and the villages.

A vital question we may ask. Is it necessary? And to this we would give a decisive answer in the affirmative. We who have labored in the smaller cities and towns have come into close contact with the farming population. In

fact they form a considerable part of our clientele. We know that the teeth of the children born and raised on the farm are liable to decay as are those of their city cousins.

Besides being so far removed from the office of the dental surgeon, the difficulties of having teeth treated or cared for are just that much greater, and therefore likely to be neglected.

However, with the improvement of roads and the introduction of electric railways and telephones the handicaps are being overcome. In the subdividing of the Province into inspectoral divisions each inspector is allotted about one hundred schools. Under present regulations before a complete system of medical and dental inspection could be inaugurated and maintained one hundred school boards would have to be whipped into line and held there.

Should the Government make inspection compulsory it would then be simple enough. The same divisions would suffice that have already been made. Medical and dental inspection could then no doubt be made by the same official.

Should the municipality undertake the care of those unable to pay for services these could be sent to one or any of the dentists in the nearest town.

I am sure that on a subject so new to us as this there must be a diversity of views as to the means of arriving at the desired goal. Out of a thorough discussion some feasible system may evolve.

Dental Ethics.

H. WOOD CAMPBELL, D.D.S., RICHMOND, VA.

Mr. President and Gentlemen of the Richmond City Dental Society:

CHE subject of ethics as an abstract proposition is given a subordinate position in the minds and feelings of too many dentists. Most of us tacitly acknowledge the claims which society has upon us and are careful not to overstep the bounds of propriety and proper deportment. That something which holds us in line and compels some—not all men and women—to lead a decent and correct life, is what is commonly called public opinion and, while this force may or may not at all times be right, it is so potent that very few have the ability to withstand it whether it is right or wrong.

I am an optimist in my general makeup and accordingly I am of the opinion that the great body of the people are better to-day than they have ever been, and that the general conclusions drawn by the public, which go to make up public sentiment or public opinion, are nearer right to-day than at any other period of the world's history. I do not believe, however, that we have reached a period or will ever, when men will be infallible and when we can say with truth, "The voice of the people is the voice of God." The subject of ethics has occupied the minds of the greatest men who have ever lived, and the teachings of Plato, Socrates and Confucius, as well as others, have come down to us from the misty ages of antiquity, with a brightness and inspiration that forces the conviction upon our minds that man has always had within him a divine spark of inspiration—feeling after higher ideals, a clearer light, a higher life has actuated every great teacher of ethics since the dawn of history. A striving after the attributes of God is what man has ever had in mind and an end for which he has ever worked whether he clearly understood God or not.

We conclude then that society has always had its ethical standards, and that it enforces them with almost tyranical severity as regards the units which constitutes its body and, but for this conserving power, disintegration and destruction would inevitably follow.

All of our law and order are based upon the principles enunciated in the decalogue, and the summing up of the whole, "Thou shalt love the Lord Thy God with all thy mind and with all thy strength and thy neighbor as thyself," and that there can be no higher standard of ethics than a sincere love for God and man no one will dispute. This thought has been much used by popular orators to attract the hearts and minds of men.

The Fatherhood of God and Brotherhood of Man is really more than a catch phrase. It contains one of the most profound truths that ever came into this world—a truth which was exemplified in the life of the Son of God Himself. Upon this great truth we have endeavored to build ethical rules and forms which should govern certain societies and professions, and for a short time to-night I wish to talk to you about ethics as it applies to our profession, and in doing so I am not going to confine my remarks to any formulated code, but I will outline to you my idea of what constitutes an ethical practitioner, and at the same time give you some thoughts on what constitutes an unethical practitioner.

I trust whatever I shall say to you will be taken in the

spirit in which it is intended, viz., that of the kindest feeling for all and a desire, if possible, to say something that may help someone to higher ideas of life and conduct.

In our societies we lay down certain fixed rules of ethics. We say certain lines of conduct are not considered the proper thing for an ethical man to engage in. We specify advertising in newspapers and flamboyant posters, hand bills, etc., setting forth the great ability, skill and cheapness of the product evolved by the brain and wrought by the hand of the advertiser; the display of one's name and titles in conspicuous places in bold type—all of these grossest acts are an offense against the finer feelings and instincts of the professional gentleman, and instinctively his keen sense of propriety and high professional honor revolt at the very thought of such conduct—not to mention the faults and misleading statements which are in nearly every case set forth.

Unfortunately for many of our younger men and some of the older ones also, when the subject of ethics is mentioned they revert in their minds to such overt and flagrant conduct, and conclude that if they are free from these they are ethical in conduct and should be so regarded. For our purposes we will pass such forms of unethics as are repugnant to the finer sensibilities of gentlemen, and examine into the conduct of the man who outwardly has kept every jot and tittle of the law from his youth up. It will require a little heart searching to discern whether we are truly ethical in the highest sense of that term if we accept the implied definition given in the outset of this paper. There are many things that cannot by any means be included in ethical codes. That spirit of kindness and thoughtful consideration for the feelings and rights of others, which will not permit one to impute evil motives and actions to his brother—a desire rather to promote than to retard the progress of others—a genuine pleasure in the accomplishments and success of others.

If we look deep down in our heart we will find the motive which prompts us either to live a right or wrong life, and we can make a positive prediction of the actions of men if we can read their hearts. It seems almost like an insult to your intelligence to tell you these things, so simple that even a child knows them, and to which every one will agree without exception.

Still these are the things in life which are overlooked or ignored altogether, and yet they are the fundamental principles of ethics—social, political and professional—and therefore must be taken into account if we are to be ethical in the highest sense of the term.

While the facts and principles I am relating to you are so plain and simple, the attainment of the life which they exemplify is not by any means easy of accomplishment. There is in most men an egotistical spirit, the foundation or source of which is selfishness—a tendency to magnify one's accomplishments above those of his fellows and not to see the good which could be discerned. Sometimes this spirit is so subtle that the individual is quite unconscious of its existence and would resent the imputation that such a fact existed. Again there is no attempt to conceal from oneself or others the ugly, hateful spirit which wounds or mars its possessor as much or more than the object of his ill feelings.

One of the finest dentists I ever knew and a man of great force of character, one who could have influenced young men very greatly for good, had his life warped and made unlovely simply because he hated a professional brother, and did not fail to express his hatred to any one whom he might meet. Yet, had this man been accused of being unethical, it would have been a mortal offense to him. Still he was most unethical and his attitude to others hurt his own life more than that of his enemy.

If we are to put our actions toward our fellows upon the lowest motives that could actuate us, viz., selfishness, it would pay us to appear kind and considerate and to simulate a desire to see our neighbor prosper and succeed. In the popular slang of the day, "Don't knock your competitor. If you do, you will be injured thereby."

But, gentlemen, this is not the motive for which I am contending and which I conceive to be the spirit which should actuate the truly ethical man. I said in the beginning that the mind must ever strive to attain the attributes of God and God is love. That one word sums up the whole matter so far as we are concerned. It eradicates all hatred and envy, jealousy, false pride, enmity and strife. We do the right because we love our neighbor and, while we may see in him some things which we really may not admire, we will not allow these to shut out all vision of those things which we know to be admirable.

All men are different in their mental and physical make-up and in our judgment of others we should, as far as possible, analyze the motives which actuate conduct and weigh them against the finished product in the form of results.

It is a fact that oftentimes men, who are using their best thought and much of their time to promote the general good, are maligned and defamed. We do not need to be told this, for the pages of history are replete with evidences of the

fact, and it takes a strong man and a genius who is on fire with zeal for his work, to withstand the attacks of enemies and detractors.

No code of ethics, however inclusive it may be, will prevent such attacks, and no code can be so worded that men cannot detract and wound their brethren and still to the outside world have every appearance of being strictly ethical, and this is the sad part of the whole situation.

In the church, such a person is a hypocrite—pretending to be a Christian and still a child of the devil. In professional life, he is no more or less than a hypocrite. The word hypocrite is a harsh one and should be used only when there is no doubt in the mind of the fact that such a term applies to the individual.

Men are often guilty of actions which may seem to others to be wrong and to reflect upon others when down in their hearts they are free from any intention of wrongdoing.

Again, the motive which controls the act and not the act itself should be the rule of judgment. Not that one is to be excused for improper actions simply because he should say that no evil is intended. If such a trivial and flippant course of life should actuate one, he would not be worthy of a place in professional life. A sincere and manly man will endeavor to so shape his actions that he will avoid doing those things which would be an offence to others, always keeping clear in mind the things that are right and true, and these are not hard to discern, as that monitor which is in the breast of every man, although not always an infallible guide, will always bring every man sufficiently near to the truth to enable him to say, "I have not knowingly done evil to my brother."

It will be observed that I am endeavoring to put the whole question of ethics upon a plane where it rightly belongs, and I am not unmindful of the fact that I may be called an idealist, and really I am in a sense an idealist—not in the sense of placing the standard of ethics upon such a high plane that men cannot attain to it, for I know that these principles can be embodied in the lives of all; in some probably to a higher degree than in others, but still in all in a sufficient measure to make the life and conduct pure.

The question of right living, which, after all, is pure ethics, is to a great degree one of education, cultivation and discipline, and at this point the society and the school are to do the work. The school in the discharge of its highest duty must of necessity take into consideration the training of its students in the high ideals of mind and heart, as well as the

technical and scientific side. Otherwise the product will not be well rounded and symmetrical.

I am fully aware that this is no easy task, but it is one well worthy of the best thought and endeavor of the men at the head of our institutions of learning. How it may best be accomplished is not in the province of this paper, but the subject has occupied the mind of the writer to a great extent, seeing as he has the graduates from most of the schools in this country pass through the trying ordeal of a State examination.

The society stands next to the school in its responsibility for exemplifying the principles of true ethics and, as society in general enforces its mandates upon the individual and he must not overstep the bounds of propriety on penalty of ostracism, so the professional man is responsible to the society for his actions and must live at least an outward life which conforms to its fixed rules, and therefore the society stands alone in this respect.

Its possibilities are almost unlimited for good if it will but use them. Many a man has found in intercourse with his professional brethren in society work an uplift which has changed the whole course of his life. Every young man should affiliate with some good society, for by so doing he is putting himself in a position to receive help and to give others the benefit of what may be of service to them. It should be the special pleasure of the older members of the society to encourage those who are entering the profession to unite with the State and local society.

The society is the place where discipline can be enforced and where the influence is or should be all against anything that is unethical and wrong in conduct. Now, do not expect perfection. We do not possess it ourselves and should not expect of others what we cannot give. We may have our feelings jarred sometimes, even in our society meeting by a brother, but what if we do, probably we have jarred someone ourselves. Look for the good, be kind and thoughtful. It will help us to overlook the small, petty jealousies of life.

Let us remember that, while our societies have rules the infraction of which will bring discipline and correction upon us, there are forms of life and conduct not written which make a man unethical who may live strictly by the code. Many actions which may seem small to us and which may be engaged in without thought on our part, are positively harmful to our brother—so much so that by the use of them his good name is damaged or destroyed, and distrust and suspicion aroused to such an extent that he may be seriously injured and probably ruined. Sometimes this is brought

about by a form of insane jealousy which amounts to hatred of our brother in the last analysis. It is accomplished in an insidious manner by innuendo, a shrug of the shoulders, a smile, a sneer, a slighting remark or absolute silence.

Let us not use any of these weapons in our intercourse with our brethren. They are of such a nature that we cannot afford to use them, even if we wish to do so. If they are used the result will never depart from our own lives.

I love to think of an ethical formula which has been a great source of comfort to me and which has kept me from many a pitfall. I will give it to you with the hope that it will be of as much benefit to you as it has been to me. "Lord, who shall abide in Thy tabernacle, who shall dwell in Thy holy hill? He that walketh uprightly and worketh righteousness and speaketh the truth in his heart. He that backbiteth not with his tongue, nor doeth evil to his neighbor, nor taketh up a reproach against his neighbor."

Mr. President and Gentlemen, if I have been able in this poor paper to bring to your minds a thought which may be of inspiration to you for a closer fellowship and a desire to look for the good, to strengthen the weak, I shall feel amply repaid and gratified that opportunity came to me to be of service.

I have no apologies to make for the close relation this paper bears to the Scriptural line of life and conduct, or for the quotations from the pages of the greatest of all books. I wish to emphasize the fact that all ethical rules and forms must of necessity be founded upon it as the source. It is a sad fact that there is in the breast of man a principle, or more properly a force, which we know of as evil, that lives and thrives entirely by the destruction of the lives and happiness of others, and though the pursuit of fame, honor and wealth are accumulated by its practises and methods, there is always a bitterness which destroys all of the sweet—if men could but realize this fact it would not be so hard to work a reformation.

We are often prone to take a gloomy view of conditions which sometimes assumes a languid indifference. We long for rest from the whole task and are apt to say with the Lotus Eaters:

"Death is the end of life; ah, why
Should life all labor be?
Let us alone. Time driveth onward fast,
And in a little while our lips are dumb.
Let us alone. What is it that will last?
All things are taken from us, and become
Portions and parcels of the dreadful Past.

Let us alone. What pleasure can we have
To war with evil? Is there any peace
In ever climbing up the climbing wave?
All things have rest and ripen toward the grave
In silence; ripen, fall and cease;
Give us long rest or death, dark death, or dreamful ease."

We cannot reason thus, whose inspiration is to uplift our chosen profession. We will not be satisfied with "dreamful ease" while there is work of such enduring character to be performed. In all situations we must show ourselves ready to adopt the sentiment of the noble Ulysses:

" 'Tis not too late to seek a newer world.
Push off, and sitting well in order smite
The sounding furrows; for my purpose holds
To sail beyond the sunset, and the baths
Of all the western stars, until I die.
It may be that the gulfs will wash us down:
It may be we shall touch the Happy Isles,
And see the great Achilles, whom we knew.
Tho' much is taken, much abides; and tho'
We are not now that strength which in old days
Moved earth and heaven; that which we are, we are;
One equal temper of heroic hearts,
Made weak by time and fate, but strong in will
To seek, to strive, to find, and not to yield."

Vancouver Dental Society.

CHE first fall meeting of the Vancouver Dental Society, held on Wednesday, November 4th, was a great success. After a pleasant time at the dinner table, the meeting was addressed by Mr. D. C. Osbourne and Mr. C. E. Ward, of the Dentists' Supply Company, New York. Much valuable information was given the society on a Modern Tooth Factory, Anatomical Articulation and Solila Trubyte Teeth. The Vancouver Dental Society is doing fine work on the coast.

Toronto Dental Society.

CHE first meeting of the Toronto Dental Society for the session of 1914-15 was held on the 9th November, 1914, and was most successful, there being over one hundred members present.

The President, Dr. George Grieve, was in the chair, and extended a cordial welcome to a number of out of town guests.

A resolution, moved by Dr. Bruce Nichols and seconded by Dr. Cecil Trotter, was unanimously adopted, extending the congratulations of the Society to Dr. J. B. Willmott upon his receiving an honorary degree from the University of Toronto. Dr. Willmott, in expressing his appreciation of the resolution, modestly stated that the university, in conferring the degree, had, no doubt, in view the recognition of dentistry as a profession in its relation to the well being of the whole community.

The subject of dental work for Army Recruits was considered at some length. The members of the society agreed to complete the dental work of those recruits who were entitled to free dental service and who would be prevented from going to the front solely on account of the condition of their teeth.

The matter was finally referred to the Oral Hygiene Committee of the Society, with Drs. Grant, Hull, Coulter and Semple added.

Dr. W. R. Pond, Rutland, Vt., was the guest of the evening and presented to the members a most instructive paper upon the subject of Amalgam. Dr. Pond's paper is published elsewhere in this issue.

The next meeting of the society will be held on Monday evening, December 7th, when Dr. Wilson, of Cleveland, will read a paper on some practical phases of Prosthetic Dentistry. Dr. Wilson is author of a work on Prosthetic Dentistry, and has specialized for many years in this branch of work.

The committee has arranged for future meetings as follows: Dr. Ward, of Ann Arbor, to present a paper on "Inlays," and Dr. M. T. Barrett, of Philadelphia, on some new phases of Pyorrhea Alveolaris.

How to Make and Insert a Fixed Lower Bridge, When the Molar Abutment is Vital and at a Difficult Angle.

By SEPTIMUS ISAACS.

(Read before the Dental Association of N. S. W.)

CHE subject I will touch upon to-night may or may not be new. At all events I have never heard or read of it. It only occurred to me after a good deal of thought.

We often have a patient who is desirous of having lower teeth inserted without a plate and is willing to give the fee we ask, but owing to the difficult angle of one of the abutments we reject the idea of a bridge and suggest a denture. Why is this done so often? Because, firstly, the dentist has to devitalize the molar tooth, so as to cut away sufficient structure to allow the bridge when finished to be inserted; secondly, the patient cannot or will not sacrifice the tooth; thirdly, the time for such treatment—extending over four or five settings—is not convenient to both patient and dentist.

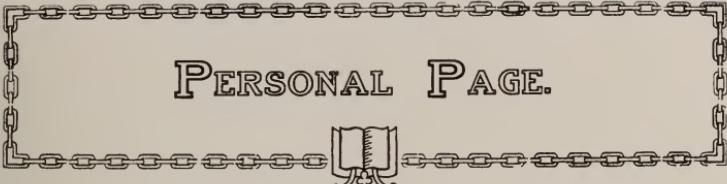
Let us take for example a lower jaw where the molar is at an angle of 45 degrees. The first step is to take an impression of both teeth to be crowned. It is my usual procedure to take two impressions, using a very small tray for each. This will take a little more time, but then you get better results, for there will be no undercuts to cause a broken impression. After running the models, crowns are made in the usual way, and after trimming up the teeth the crowns are fitted, a bite taken, and then an impression in plaster. Before running the model to this impression it is absolutely necessary to line the crowns, already embedded in the impression, with wax, to enable one to remove easily the crowns at a later period. This is important and must not be forgotten.

The upper impression is then taken. After running the upper and lower model they are articulated. The crowns are then warmed and removed from the lower model, and the wax boiled off both crowns and model. Now we are able to remove our crowns for fitting purposes whenever we choose.

The dummy teeth are then made in the usual way with the exception of the one next our molar abutment. This I would advise you to cast solid. My method of procedure is as follows: Strike up the buccal surface of a molar or bicupid, whichever is required, suitable for the space, then fill in with wax to form a cusp. Prior to this, a small retainer is soldered to the struck-up shell; then wax is placed in the shell and a cusp is carved. Take a piece of carbon, such as is sold at a depot, covered and rolled with wax. This is then cast and we obtain a hollow tube when the carbon is removed; this, however, is not removed till a later stage. The tube is then cut into three parts, to form parts of a hinge. Around each one or two pieces is wrapped a piece of pure gold with both ends extended to form a fishtail. These two pieces are then put into the wax cusp in a position that will serve as a hinge. The dummy is then invested and cast in the usual manner. We have now our bridge waxed up ready to join, with the exception of the molar crown. While the bridge is cooling off we take our third portion of the cast tube and wrap pure gold round it. Solder as before, leaving two ends of pure gold (pure because it is thin and will not interfere with bite)—one to solder on the cusp of the gold crown, the other on the side, after first getting the exact position of the hinge, to allow our pin to be inserted. It is as well to wax this part in position; remove the crown from the model and invest to keep in position. This, with an iridio-platinum pin riveted each side of the hinge, completes our work. The bridge is then polished, and the molar, which is now on a hinge, is first cemented on the tooth and the remainder of the bridge hinged over the other abutment.—*Commonwealth Dental Review.*

The Forsyth Dental Infirmary for Children.

CHE dedication of the Forsyth Dental Infirmary for Children, Boston, took place on Tuesday, November 24th, 1914.



PERSONAL PAGE.



DR. Walter G. Kennedy was recently elected President of the St. Patrick's Society, Montreal.

Dr. E. A. Higley, formerly of Blenheim, has commenced practice in Chatham, Ont.

Dr. E. S. Hardie, of Guelph, has opened an office in Hensall, Ont.

Dr. Ray S. Goodwin has opened an office in Kitsilino, Vancouver, B.C.

Dr. A. J. Holmes, of New Westminster, B.C., was accidentally shot by a friend while out hunting near the Fraser River. The many friends of Dr. Holmes sincerely hope for his rapid recovery.

A special committee has been appointed by the British Columbia Dental Association to inquire into Dominion Registration. This committee will report to the meeting early in February.

The next examination of the British Columbia Dental Board will be held in Vancouver on November 16th.

Dr. G. A. Bentley, of Cleveland, Ohio, has taken charge of his brother's (W. J. Bentley) practice at Sarnia. Dr. W. J. Bentley is with the first Canadian contingent at Salisbury Plains.

Captain C. B. Stover, D.D.S., was married to Miss Bell, daughter of Dr. F. F. Bell, of Windsor, before leaving to join the 18th Battalion in training camp at London, Ont.

Dr. Leuman M. Waugh, formerly of Buffalo, will practice Orthodontia exclusively at 576 Fifth Avenue, New York.

Dr. Emery C. Jones and Dr. A. J. Brett, both of New Westminster, B.C., are wearing "The smile that won't come off" these days. A fine little girl in the first case and a bouncing boy in the second case.

On Wednesday, November 5th, Mr. J. W. Leighton (Leighton & Jackes) was married to Miss Martha Russell Smellie of Charles St., Toronto. Congratulations!

During the season lawn bowling has been very prominent in the profession, and several have made very good records. Dr. E. W. Paul's rink of Alexandria L. B. C., won the big event of the Buffalo tournament, the International Trophy,

and also the Lafayette Trophy for doubles. At the Ontario Bowling Association he won the third prize in singles. At the Dominion Bowling Association his rink, from Canada Club, including Dr. C. A. Kennedy, won for the second time in succession and third time in five years, the Ontario Cup. This same team won the Butt Trophy at the end of the season in a play off of winning rinks in the different tournaments of the season.

Dr. T. H. Wylie, Rusholme Club, won the principal event in the Granite tournament. He was also winner of the doubles in the Alexandria Club Tournament and received second prize in the Consolation competition. Dr. Alex. Jordan, Rusholme Club, played on the team which won the Consolation event at the London Tournament.

Obituary.

IT is with great regret that we report the death of Mrs. Grieve, wife of Dr. Geo. W. Grieve, of 2 Bloor St. W., Toronto. The sincere sympathy of ORAL HEALTH and the dental profession is extended to Dr. Grieve.

Dr. Gordon I. Robertson died at his family residence, 15 Jepson St., Niagara Falls, on Tuesday, November 17th, 1914. Dr. Robertson was a graduate of a couple of years ago, and the younger members of the profession particularly will feel deeply the cutting off of this young and promising life.

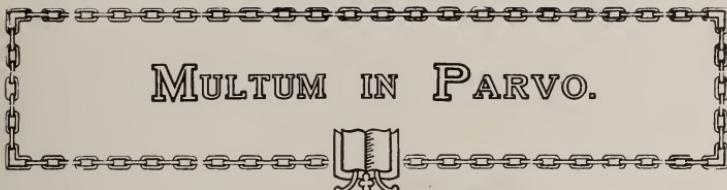
Oral Hygiene Reports.

Peterboro, Ont.

The Nurses' Association of this city held a meeting recently in the public library, which was largely attended. The association was addressed by Dr. J. E. Middleton on the subject of Oral Hygiene.

Newark, N.J.

Dr. Homer C. Brown, of Columbus, member of the State Board of Health and President of the National Dental Association, spoke recently at the State Health Exhibit, emphasizing the importance of caring for the teeth and mouth.



MULTUM IN PARVO.



This Department is Edited by C. A. KENNEDY, D.D.S., 2 College St., Toronto

Librarian, Royal College of Dental Surgeons of Ontario

Helpful Practical Suggestions for publication, sent in by members of the Profession, will be greatly appreciated by this Department.

PROTECTING THE PULP UNDER SILICATE CEMENT FILLINGS.

--A simple means for protecting the pulp under a silicate cement filling consists of a pellet of white gutta percha of suitable size. White gutta percha is preferable to pink, as silicates are inserted chiefly in anterior teeth, and the pink gutta percha might shine through the filling.—*Zahnaerztliche Rundschau, Dental Cosmos.*

MATCHING TEETH IN THE MOUTH.—When matching the shade of a natural tooth, as a guide to the selection of teeth for a denture, a large mouth mirror should be placed behind the specimen artificial tooth when in position beside the natural one. This will show up the two teeth and allow of a very much better comparison.—*Edward's Dental Quarterly.*

CONDENSATION OF AMALGAM.—For the thorough initial condensation of amalgam, Dr. Bonwill's suggestion of a peldorf of cotton or bibulous paper seems to fill the bill thoroughly. Properly used, it blocks the orifice of the cavity and carries the plastic amalgam under pressure into all the nooks and corners of the cavity, so that it forms a foundation upon which more amalgam is readily packed.—*W. H. Freeman, Dental Brief.*

TO PATCH A LEAK IN BELLOWS DISK.—Often a bellows disk will break during an important soldering operation. To make a quick repair—providing the break is not too large—a piece of red vulcanite of about twice the size of the break is cut, moistened with a little gasoline, and pressed firmly to place. The linen cover should not be removed from the rubber, for it makes a stronger patch.—*R. L. Hesser, Dental Summary, Dental Cosmos.*

ORAL HEALTH.

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EDITORIAL.

Election of Directors for the R.C.D.S. of Ontario.

HERE are few official dental bodies undertaking more important work than the Board of Directors of the Royal College of Dental Surgeons of Ontario. The members of the Board are entitled to the gratitude of the profession for the splendid work accomplished. Dr. W. J. Bruce and Dr. G. C. Bonnycastle, after years of faithful service, are retiring this year, and have not offered themselves for re-election. In six districts the elections have been by acclamation, with results as follows:

- District No. 1—Dr. W. C. Davy, re-elected.
- District No. 3—Dr. W. Cecil Trotter, re-elected.
- District No. 4—Dr. Donald Clark, re-elected.
- District No. 5—Dr. W. M. McGuire, re-elected.
- District No. 6—Dr. Charles E. Sale.
- District No. 7—Dr. H. R. Abbott, re-elected.

In District No. 2, where there will be a contest, the candidates are Dr. O. A. Marshall, Belleville, and Dr. M. A. Morrison, Peterborough. For this district ballots will be sent to the "qualified electors" on November 22nd. Those returned will be counted in the Board Room of the College on December 9th at two o'clock by the scrutineers appointed by the Board.

